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AMERICAN BEER

Glimpses of Its History and Description of
Its Manufacture

NEW YORK:
UNITED STATES BREWERS' ASSOCIATION
...
1909



PREFACE

THIS book is composed mainly of selected parts of two separate essays written by the undersigned and published many years ago on two different occasions and for two widely dissimilar purposes.

The reproduction of these sketches in the present form appears to be warranted by a growing demand for information concerning the process of brewing of which one of the two essays here referred to contains a popular description, often quoted not only in magazines and newspapers, but also in encyclopaedias. That booklet, copyrighted by Mr. George Ehret, is now out of print; but with characteristic kindness Mr. Ehret has authorized the United States Brewers' Association to reprint the whole or any part of it, as present needs may demand. We have, accordingly, reproduced without abridgment everything relating to the processes of brewing, malting, refrigeration, etc., and have only changed or amplified the remainder of the text in such a manner as to bring it up to date.

As to the historical part, the sketches herein contained are not intended to go beyond the narrow limit indicated by the sub-title. They afford only random glimpses of the history of American brewing, but enough, probably, to create in the mind of the reader a desire to read those other books published by the Association, in which the subject is treated fully and comprehensively from various points of view.

G. THOMANN.

NEW YORK, NOVEMBER, 1909.

CHAPTER I.

NEW ENGLAND

THE writer of an historical essay dealing with the origin of the art of brewing, even in countries of comparatively recent civilization, cannot escape the necessity of taking into account a certain element of mythical obscurity, calculated to throw a legendary glamour around and about the introduction of a beverage, the invention of which has been ascribed by the popular imagination of ancient times to certain benevolent gods, either male or female, according to the mythological systems of the different countries.

Even the history of brewing in New England is not entirely free from this legendary element, although there is, indeed, no dearth of well-authenticated historical facts from the very moment when the new communities emerged from the primitive conditions of the earliest camp-life. There can be no doubt that on the soil of New England beer was consumed by people of European origin long before the landing of the Pilgrims. On their adventurous voyage of exploration, which resulted in the discovery of Vineland, the Vikings, it may safely be assumed, carried with them a supply of their favorite beverage; and there is more than an ordinary degree of internal probability in the assumption that Bartholomew Gosnold, who in 1602 landed at the point which he named Cape Cod, brought with him from Falmouth an ample supply of ale, which in those days was deemed an indispensable commissary article of every ship destined for the New World. The fact that Gosnold's party—the first Englishmen who trod

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upon Massachusetts soil—looked forward to a permanent settlement, lends additional force to our view. It may also be safely assumed that malt liquor was brought by all the exploring expeditions that touched the coast, or attempted settlements thereon; and this certainly applies to the party of John Smith, to whom we owe both the name and a printed description of New England.

THE
MAYFLOWER'S
ALE

Concerning the Pilgrims of the "Mayflower," history affords ample evidence that they carried with them a supply of good old English ale, the brewing of which they had continued in Holland, according to their own method and formula. At this point, however, legendary fiction appears to have invaded the sacred domain of Clio. It is said that this supply of beer was exhausted somewhat earlier than the organizers of the migration scheme had anticipated, and that, therefore, a landing was effected at the rather uninviting spot since then immortalized in song and story as Plymouth Rock. Whether conceived in a facetious spirit, prompted by a knowledge of the Puritans' well-known appreciation of liquid cheer, or based, as it is claimed, upon the semi-historical authority of a private diary, the story is characteristic enough in all its bearings to be true; and, if it were so, what a splendid illustration it would be of the old axiom, that in history very insignificant causes sometimes produce most marvelous effects!

It is an historical fact that Robinson's stout-hearted flock of "Separatists," while yet at their first place of refuge in Holland, and considering, with all the seriousness of their character, the advisability of migrating to the Western World, were long undecided as to the course they should take; whether to accept the invitation of the Dutch to settle in New Amsterdam, or to avail themselves of the inducements held out by the Virginia Company, or finally, to create an independent community in New England. Even after their embarkation, it was not posi-

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tively determined whether Virginia or New England should be their destination. Now it may easily be conceived that, in conjunction with the historically demonstrable causes of the landing at Plymouth, the lack of beer helped to accelerate a final resolution, and thus prevented a settlement in Virginia—a course which might have turned the subsequent current of our national development into a direction totally different from that which led us on to political, moral and physical greatness. If we duly consider what all historians are agreed upon, namely, that the people of that part of the mother-country whence the New England colonists originally emigrated, still represented, in a remarkable degree of purity, the old Teutonic stock—German tinged with Northman's blood—we may be all the more inclined to accept this beer story seriously; at all events, we shall understand perfectly what history tells us of the colonial brewer and his place in the infant society.

THE FIRST BREWERY

The first authentic record of the existence of a public brewery dates back to 1637, so far as Massachusetts Bay, and to 1638, so far as Rhode Island is concerned; the former brewery was the result of the personal enterprise of Captain Sedgwick, the latter a communal creation of Roger Williams' nascent colony, a combined brew-house and tavern, placed under the supervision of Sergeant Baulston. These were not the first brewers, however, for, some time before either of them was mentioned, the licensed tavern-keepers had obtained permission to brew, or rather, to speak more correctly, were *directed* by the governing authorities to brew beer, of which both the quality and the price formed the subjects of early legislation and regulation. In addition to these brewing tapsters, as we might style them, nearly every well-to-do housewife brewed beer for her own household consumption. While the domestic manu-

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facture of distilled liquors, carried on in a most primitive way, was not likely to be neglected by a people whose drinking habits were quite as conspicuous as their piety, valor, endurance, prowess and moral rectitude, the early local histories and laws afford abundant proof that the best minds earnestly endeavored to stem the growing predilection for ardent spirits by bestowing fostering care upon brewing and malting.

The first regulative measure of this kind, the very one which unwisely gave to the afore-mentioned Captain Sedgwick a monopoly of brewing strong beer, was conceived in this spirit, and a subsequent law (1639) restoring to all tavern-keepers the right to brew all kinds of malt liquors, without any restraint whatever, at the same time restricting the sale of ardent spirits to one person in each town, such persons to be appointed upon the recommendation of their respective town authorities, reveals in a palpable manner the objects of the lawmakers.

**SOME
ILLUSTRIOUS
BREWERS** The social standing both of the public brewer and the brewing tavern-keeper must have been a very exalted one; and for this assertion there is a strong and direct evidence, not only in the fact that only voters and church members, men distinguished by their godliness and exemplary deportment, could obtain the right to brew and dispense beer, but also in the still more significant provision of the earlier laws making the licensed persons responsible for the moral conduct of their guests and admonishing them to discountenance upon their premises any practices "not to be tolerated by such as are bound by solemn covenant to walk by the rule of God's word."

This established the character and standing of the business, which in many instances derived additional lustre from the character and standing of the men engaged in it, for it is an indisputable historical fact that many brewers and taverners not only occupied prominent civil and mil-

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itary positions, but became influential leaders, distinguished alike by valor in the field and wisdom in council, and transmitting to their off-springs (by heredity, perhaps, no less than by the formative power of example) that spirit of patriotism which gave birth to our Nation.

In the course of this narrative, this subject will again be adverted to; but for the present, in order to put our readers in a receptive mood, the mere mention of a few historical names will doubtless suffice. Such names, for instance, as that of Samuel Adams, one of the foremost of our Revolutionary forefathers, the son of a brewer and himself a brewer, as proud of his calling as doubtless were the Revolutionary generals Putnam, Weedon and Sumner, who also brewed and sold beer. General Putnam distinguished himself alike by the ardor of his patriotism and his undaunted courage and masterly generalship. In addition to tilling his own lands, he carried on the two-fold business of brewing and tapping until, obeying his country's call for brave hearts and stout hands, he joined the Revolutionary army, in which he won great honor and lasting fame. After the war he returned to his old home in Brooklyn, Connecticut, resuming his old business and retaining control of it to the end of his days.

The average Vermonter of our times, who up to 1904 had lived under a prohibitory law and become accustomed to look upon brewing and tapping as callings to be shunned by decent people, may possibly find it difficult to realize that the first Governor of the Green Mountain Republic, Thomas Chittenden, the man who fills a larger place in the history of Vermont, and who has done more for the independence and civic welfare of his people than any other, was a brewing tavern-keeper—a man whose unselfishness, patriotism, courage and wisdom won for him unstinted praise at home and abroad.

A modern historian (Rowland A. Robinson in "*American Commonwealths*"), with a keen perception of the

fitness of things, concludes his work with these words: "The history of Vermont is one that her people may well be proud of. Such shall it continue to be, if her sons depart not from the wise and fatherly counsel of her first Governor (Chittenden) to be 'a faithful, industrious and moral people,' and in all their appointments 'to have regard to none but those who maintain a good moral character, men of integrity and distinguished for wisdom and abilities.' "

One cannot mention Chittenden without thinking of his friend, Captain Stephen Fay, the landlord of the Catamount Tavern, who had five sons in the Battle of Bennington, and left one of them dead upon the bloody field. It was in the council chamber of this Catamount Tavern that the leaders of the Green Mountain Boys, among them Ethan Allen, met after the Battle of Lexington and determined to "unite with their countrymen" against the common enemy.

Nearly every liberty-pole in revolutionary and pre-revolutionary days stood before a tavern, the headquarters of the Sons of Liberty; and not infrequently the tavern-keeper was the leader of the band. In her "Stage Coach and Tavern Days," Miss Alice Morse Earle has a chapter on the "Tavern in War," which opens with this paragraph:

"The tavern has ever played an important part in social, political and military life, has helped to make history. From the earliest days when men gathered to talk over the terrors of Indian warfare; through the renewal of these fears in the French and Indian Wars, before and after the glories of Louisburg and through all the anxious but steadfast years preceding and during the Revolution, these gatherings were held in taverns and ordinaries. What a scene took place in the Brookfield tavern! The only ordinary, that of Goodman Ayers, was a garrison house as well as a tavern and the sturdy landlord was commander of the train band."

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Miss Earle cites many such examples and we might readily add a score of illustrious names borne by tavern-keepers and brewing tapsters who distinguished themselves in the Revolution and whose deeds form some of the most brilliant chapters of our history.

If the British considered the taverns as the hot-beds of sedition, as in fact they did, the Patriots with equal justice regarded them as the nurseries of liberty; and it is not at all unlikely that in the tavern of his father-in-law, where he so often made himself useful as a tapster, Patrick Henry imbibed the ideas which culminated in his soul-stirring utterance, "Give me liberty or give me death."

Enough has been said, we trust, to prove the truth of the assertion that throughout the Colonial period, and up to the time of the adoption of the Constitution, the trade was practiced by the very best people—men whose names adorn the pages of our history, and remind us of the fact that this industry has at all times given to the cause of freedom and popular rights some of the most eminent champions; such men as James Artevelde, to whom Hewlett, in his "Heroes of Europe," accords a prominent place, or Santerre, whom Dumas regarded as "the gigantic personification of the popular will," a man who sacrificed all he possessed in order to alleviate the sufferings of his people.*

SPIRIT In all the laws and ordinances relating to
OF EARLY brewing, erroneous economic theories, fiscal
LEGISLATION considerations and a natural but often misguided desire to foster home industries, seemed to be in continual conflict with the avowed intention of encouraging the consumption of malt liquors, not only for moral and hygienic reasons, but also because the minds of the Puritans were imbued with the strong conviction that beer was the salvation of the British nation; a sentiment to which in the following century, the laurel-crowned poet, Warton, gave eloquent poetic utterance in his "Ode to Oxford

*For the names of prominent brewers in New York, see Chap. II.

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Ale." This conviction arose from an appreciation of the physical, moral and intellectual qualities of a race addicted for many centuries to the use of beer, as compared with the effects of spirits, just as in our own time the celebrated Pasteur wrote a book designed to encourage brewing, because, as he states in the preface, he attributed the superior physical qualities of his country's conquerors to the use of malt liquors.

Unfortunately, every effort to accomplish the purpose here referred to, was frustrated by countervailing circumstances, resulting from the imperfect state of the art and the lack of proper materials, or by unwise measures, usually of a fiscal or protective character, adopted by the authorities under pressure of monetary needs or false theories. For instance, at one time the importation of malt was forbidden, in order to stimulate domestic malting; yet, within a short time thereafter, the malting of domestic wheat, rye and barley was prohibited on account of the scarcity of these cereals. At another time, a desire to encourage the exportation of wheat led to the enactment of a law imposing upon brewers a fine of ten shillings for every bushel of wheat used in brewing. Ordinances encouraging brewing by exempting beer from taxation were counteracted in their contemplated effects by regulations prescribing the quality and fixing the price of malt liquors without regard to the increased cost of materials and production. And in later periods the requirements of commercial barter with the West Indies and the competition with other American colonies for this trade, dictated measures protecting home distilleries in such a manner and to such an extent that the drinking habits of the people could not but be changed for the worse and brewing doomed to decay. The lawmakers realized that there was great need of discouraging the use of strong drinks among a people who while "fighting and praying," consumed immense quantities of "fiery Holland," which, as Holmes puts it,

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"All drank as t'were their mother's milk and not a man afraid."

But the condition of things militated against the realization of their object, as we have shown, and thus within less than one hundred and fifty years, with the growing demand for rum as a medium of barter, brewing gradually declined, and inebriety continued to spread throughout the colonies with such alarming rapidity that again—too late, unfortunately—the lawmakers of the different colonies vied with each other in strenuous but fruitless attempts to revive the industry. These efforts were continued in the New England States and elsewhere after the Revolution; and as an illustration of them may be quoted the Massachusetts Act of 1789, "to encourage the manufacture and consumption of strong beer," totally exempting from all taxation the entire real and personal property of brewers. As one of the reasons for this measure, the act sets forth the fact, "that the wholesome qualities of malt liquors greatly recommend them to general use, as an important means of preserving the health of the citizens of this commonwealth, and of preventing the pernicious effect of spirituous liquors."

That under more favorable circumstances the industry would doubtless have progressed rapidly we may infer from the uncommon degree of prosperity which both malting and brewing attained during the brief intervals of the unhampered operations of fostering legislation. As early as 1641, John Appleton, a representative to the General Court, established a very fine malt-house, and engaged extensively in the cultivation of hops. He and Samuel Livermore began very early to experiment with maize as a substitute for wheat, oats or barley, and Winthrop, the younger, of Connecticut, having devoted serious study to this question, finally read a most interesting paper on the subject before the Royal Society in London, presenting at the same time samples of Indian corn beer

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of a very palatable nature and good quality. The malt of New England soon acquired a wide-spread reputation for its excellent quality, and relatively large quantities were exported to the neighboring colonies, particularly to Pennsylvania. This historical fact is of more than ordinary interest, for it shows that the use of maize, a material which, in conjunction with malted barley, the modern brewer uses for the improvement of the quality of his product, is a thoroughly American practice, sanctioned by long experience, and approved by the taste of the consumer. In a primitive way, however, Indian corn was used for brewing very much earlier, if we may believe Sir Richard Grenville, who, in his description of Virginia, relates that he saw maize used in brewing by the English of that colony.

**EFFECTS
OF
FREE RUM**

Practically, brewing had ceased to exist as an industry before the New England colonies had reached Statehood; it was revived for a short space of time when Alexander Hamilton introduced his revenue system, and many members of Congress, prompted by moral and hygienic considerations, supported his efforts to encourage the manufacture. The spirit of the times as to this question is clearly reflected in the speeches of eminent statesmen and the writings of philosophers, all of whom agreed, to quote the words of the "Digest of Manufactures" and of Gallatin, that "the moralizing tendency and salubrious nature of fermented liquors recommend them to serious consideration." But neither such sentiments nor the positive labors of Dr. Benjamin Rush, who aimed at the popularization of beer through the total exclusion of ardent spirits, could prevail against the firmly rooted predilection for spirits, made universal by the general practice of rural distilling in all grain-producing States as well as in those States in which the trade with the West Indies made molasses a common article of barter. In the entire country, excepting New

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York and Pennsylvania, the total production of malt liquors in 1809-10 amounted to barely forty-five thousand barrels, of which about twenty-three thousand barrels (31½ gallons) were brewed in Massachusetts, while New York and Pennsylvania produced 139,000 barrels.

During the brief era of the first internal revenue system, with its Whiskey Revolution and other open violations of the law, brewing did indeed regain some of its lost ground, only to relapse again into its former somnolent condition, however, as soon as the "free-whiskey" policy was reintroduced.

When, four decades after Hamilton's régime, the temperance movement began to make itself felt in New England, the brewing industry, the very agency which all our great statesmen had sought to employ against the whiskey habit, had to atone for the sins of the rural distillers, to whose unlimited operations is due all the misery and degradation that lent a justifying aspect to the demands of the reformers. Under prohibitory rule in Maine, New Hampshire, Massachusetts and other eastern States, the general use of ardent spirits, manufactured outside of, but freely sold within the borders of these States, tended to confirm the rum habit, and this was all the more inevitable, because for reasons well known to every one familiar with the question, malt liquors cannot be sold surreptitiously without great expense and imminent risk of detection.

This explains why before the introduction of the internal revenue system of 1861, which imparted a powerful impetus to brewing throughout the country, the industry lagged behind in Massachusetts, Connecticut and Rhode Island and was never able to gain a permanent foothold in Maine.

In 1863 the total production of malt liquors in all the New England States, excepting Massachusetts, amounted to 49,607 barrels, a little more than double

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the quantity produced in 1809-10 in Massachusetts alone. Of these 49,607 barrels Connecticut produced 13,055; Maine, 2,207; New Hampshire, 25,945; Rhode Island, 7,029 and Vermont 1,371 barrels. In the same year (1863) the total production of malt liquors in Massachusetts amounted to 112,000 barrels.

THE COUNTER REFORMATION

At about this time a very strong current of public opinion, set in motion by official reports as to the manifest healthfulness of malt liquors as shown by sanitary inspections of the Union camps, began to weaken the indiscriminate crusades of ultra-reformers against all kinds of stimulants; and Massachusetts, then burdened by an absurd prohibitory law, again, as so often before, took the lead in this counter-reformation. Several years elapsed before the movement culminated in the now celebrated report of the State Board of Health of Massachusetts, in which Dr. Bowditch, under the title of "Intemperance in the Light of Cosmic Laws," summarized the experiences, convictions and opinions of eminent scientists, philosophers, public officials and philanthropists from all parts of the globe, and reached the conclusion, based on this vast mass of testimony, that "light beer and ale can be used even freely without any very apparent injury to the individual or without causing intoxication, and that some writers even think they do no harm, but real good, if used moderately."

The direct result of this agitation and of a comprehensive legislative inquiry into the different phases of this question, under Governor John A. Andrews in 1867, was the repeal of prohibition in Massachusetts in 1868. Connecticut, after essentially modifying the prohibitory law, totally repealed it in 1867, substituting a license law. In New Hampshire the manufacture and sale of beer, cider and native wine had not been forbidden by the so-called Prohibition Act of 1855. Rhode Island also

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repealed her prohibitory law in 1863. Vermont was the only New England State, excepting Maine, of course, in which the Maine law of 1852 remained then in force.

From the almost instantaneous effect of these measures, superadded to the operation of the Federal tax-law, the brewing industry, and, it is needless to say, the health and morality of the commonwealth, derived inestimable advantages. Within three years, *i.e.*, at the end of the fiscal year 1866-67, the annual production of malt liquors in the New England States had increased from 161,607 to 406,154 barrels. Massachusetts, unfortunately, re-enacted prohibition in 1869, permitting, however, the manufacture of liquors for exportation. In the following year this law was so amended as to permit the sale of malt liquors; and in 1871 cities and towns were authorized to decide annually by popular vote whether the sale of malt liquors should be permitted. Repealed in 1873, this act and a number of others were replaced by a license law, enacted in 1874 and supplemented in 1881 by local option. Constant changes subsequently tended to deprive the trade of stability and particularly of that complete security which lies at the bottom of every industrial success.

Although a prohibitory amendment to the Constitution was defeated in Massachusetts by a popular majority of forty-six thousand votes, in 1888, thus clearly demonstrating the will of the people, professional reformers continued their unwise opposition not only in this direction but also against any discrimination in favor of fermented drinks; and as a result every year brought forth additional restraints designed to harass a trade which Hamilton, Jefferson, Madison and many other eminent Americans, including Dr. B. Rush, the real father of the temperance movement, regarded as the most efficient temperance agency—an opinion which the scientific inquiry conducted by Dr. Bowditch proved to be almost universal. With

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slight differences as to time and mode, the trade labored and still labors under similar disadvantages in the other States. To this incessant legislative intermeddling, which frequently produced the most incongruous propositions copied from monarchical institutions or borrowed from small and insignificant cities totally unlike the great metropolis of New England in every respect, must be attributed the fact that these States are not now in the front rank of the brewing centres of this country. Even so, the progress of brewing there is not inconsiderable.

Without entering into wearisome statistical details it may be stated, in a general way, that but for adverse legislation of the nature here referred to—which, by the way, always tends to increase very considerably the home-consumption and surreptitious sale of ardent liquors—beer would in all probability be to-day the common drink of the whole people, and drunkenness, very much diminished since the more general use of beer, would be as rare to-day as it is in Bavaria.

If we compare the increase of production in the entire country with the output of Connecticut, Massachusetts, New Hampshire and Rhode Island during the decade ending in 1895—Maine and Vermont having dropped out of the list of beer-producing States—we shall find in such comparison ample reason for regretting that unwise legislation (which Dr. Bowditch rightly regards as a fruitful source of intemperance) prevented popular taste and inclination from making malt liquors what they are in many German states noted for the sobriety of their people. That there is a strong popular inclination to adopt the lighter beverages is very evident from the development of brewing in spite of all impediments. The following figures illustrate the growth of brewing and afford an intimation of the progress that would have been attained in the absence of adverse measures:

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	1885.		1895.
United States	19,216,630 barrels		33,469,661 barrels
Connecticut	128,226 "		301,872 "
Massachusetts	878,779 "		1,336,345 "
New Hampshire	322,055 "		368,628 "
Rhode Island	54,363 "		188,968 "

During the next twelve years (1896 to 1907) radical changes took place in two of the New England States. New Hampshire and Vermont adopted stringent license-systems coupled with local option; but this change from prohibition to regulation does not appear to have redounded to the benefit of brewing. Vermont is still without a brewery and the few brewing establishments which have existed in New Hampshire, even under the operation of the prohibitory law, retrograded steadily, in point of annual production.

In both States, it seems, the rural population still adheres to the drinking habits fostered by and under the old régime, and the population of the industrial centers, where as a rule beer finds its most favorite markets in other States, is composed to a large extent of French Canadians who are not commonly beer-drinkers.

In Massachusetts, Connecticut and Rhode Island, on the other hand, the condition of things, considering the instability of holdings under the fluctuations of the license votes in the first-named State, seems to be somewhat encouraging.

During the period named, the production of beer in New Hampshire decreased from 384,333 to 323,363 barrels. As to the New England group as a whole, compared with the United States, the following figures require no comment:

	Production 1896	Production 1907
United States	35,826,098 barrels	58,546,111 barrels
New England States	2,719,083 "	3,704,968 "

CHAPTER II.

BREWING IN NEW YORK.

WHILE the exact date of the beginning of brewing as a distinct calling cannot be ascertained, there is an abundance of historical evidence that among the very earliest acts of the Colonial governments, those tending to encourage the establishment of public breweries were deemed of the greatest importance. It is no less certain that whenever such encouragement did not sufficiently stimulate private enterprise to bring about the desired end, or when other reasons (hereafter to be explained) made it desirable, the rulers of some of the Colonial settlements seized upon this source of income themselves or granted monopolies to those private persons who intended to establish breweries. Thus Van Twiller, Governor of New Netherland from 1633 to 1638, erected a brewery on the West India Company's farm, which extended north from what is now Wall Street to Hudson Street, and the Patroon of Rensselaerwyck (the present counties of Albany, Columbia and Rensselaer) established a brewery at Beverwyck (the present Albany), reserving to himself the exclusive privilege of supplying all licensed retailers.

As this Director Van Twiller, mentioned above, is reputed to have been a hard drinker, ever intent on finding or creating a suitable occasion for indulging in his weakness, it is not hazardous to surmise that in erecting a brewery, he consulted his own tastes quite as much as the needs of his little community. His example is said to have influenced the drinking habits of the colonists to

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such an extent that drunkenness became a very common occurrence in the community. Captain De Vries narrates a number of incidents illustrating the weakness of Van Twiller, and among them is one which appears to deserve a place in this little sketch. Cornelius Van Voorst, the stem from which grew a numerous family famous in Manhattan and Jersey annals, was the superintendent of the colony of Pavonia, established by Pauwn. He was a man of hospitable inclinations, and had just imported a hogshead of Bordeaux wine. The rumor of its excellent quality reached the ears of Director-General Van Twiller, who, in company with Dominie Bogardus and Captain De Vries, paid the superintendent a visit by means of a rowboat. Van Voorst received the representatives of Church, State and Navy with a princely welcome. The cask was broached and the contents approved. After some hard drinking, a furious dispute about a recent murder arose between the host, the Governor and the Dominie. De Vries, the man of war, in this instance proved to be a man of peace, for by the exercise of his mediation and more claret, a truce was finally effected and "they parted good friends." This is not the dull ending, but merely the prelude to something more brilliant. Just as his guests were entering their boat to depart, Van Voorst, to show his good will, caused a swivel, which was fixed on a pillar near the house, to be fired. It was a fine salute, but a piece of wadding, falling on the Van Voorst mansion, set fire to the roof. It was impossible to check the flames and the house was burned to the ground, presumably destroying the hogshead of wine.

The business of the tapster necessarily preceded that of the brewer; for before the colonists could raise a crop of the cereals necessary for brewing—which they did, by the way, according to Isaac Jogues' description of *Novum Belgium*, in the very first year after their settlement—they had to depend upon the supply of liquors

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shipped to them from the mother country; and, from all accounts, we learn that the quantities thus imported were very large and, to modern minds, entirely out of proportion to the very scant population of the colony. In the earliest times, the condition and surroundings of the colonists were such that all available means of subsistence had to be treated very much like common property. Thus the West India Company undertook, at first, to furnish the settlers with what they absolutely needed for their sustenance,—the understanding being that the value of goods so furnished must be returned by the borrower as soon as the product of his labor enabled him to do so. This accounts for the fact that the first tap-room on Manhattan Island was located in the first warehouse erected by Minuet, then Governor of New Netherland (1626-1633).

GOVERNOR KIEFT'S CURFEW

The number of tapsters, under Van Twiller's administration, increased rapidly; but there is no evidence that brewing kept pace with this growth—probably because the importation of wines and liquors from the mother country still sufficed to satisfy the demand. When, however, in the first year of his administration (1638), Governor Kieft forbade the retailing of wines and spirits by the tapsters (virtually restricting the liquor traffic to the selling of beer) the brewing trade expanded to such an extent that a few years later an excise upon its product yielded a considerable revenue. From this time onward, brewing and retailing formed the subjects of frequent legislation both in New Netherland and in the New England colonies. The law-makers not only regulated and taxed the manufacture and sale, but they also prescribed minutely the quality and price of beer, the time when, and circumstances under which, it could be sold; the duties of the tapster and the obligations of the drinker. Kieft forbade the tapping of beer during divine service and after a certain hour at night;

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and, in order to remind the burghers and tapsters of the latter inhibition, he caused the town bell to be rung—an imitation of the old European custom of announcing the hour for retiring. His object in introducing the curfew (the Norman *couvre feu*)* was probably not confined to these things; it is quite likely that he intended thus to force upon the honest Dutch burghers the conviction that a man of strong will had come to assume the powers and functions which the licentious Van Twiller had permitted to be disregarded. Doubtless Kieft honestly endeavored to correct the evils which had grown up under his predecessor's rule; but his motives were probably not always of a purely moral character. In forbidding the retailing of wine and confining its sale to the Company's warehouse—"where," as he stated in his proclamation, "it could be obtained in moderate quantities and at a fair price"—he intended no doubt to create for himself a monopoly of this traffic; and in establishing a distillery on Staten Island, the first in New Netherland, he very likely sought to enlarge the scope of his monopoly. Fortunately, brewing had by this time grown too strong as an independent enterprise to be absorbed by the Company in this singularly arbitrary manner. It had become a favorite occupation, as a local historian justly says; and many of the best and most respected citizens engaged in it.

BREWERS REVOLT Naturally enough, the rapid growth of
AGAINST brewing suggested to Governor Kieft
A TAX the expediency of levying a tax upon beer,
and he imposed this all the more readily because, in consequence of the Indian War which he had provoked by a "shocking massacre of savages," the treasury was totally depleted. In 1644, he levied a tax of three guilders upon every tun of beer manufactured by a brewer, and of one florin upon every tun brewed by private citizens for their

*The old German night-watchman's hourly song began with the announcement of the hour of the night and the admonition to guard fire and light.

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own use. Aware that the imposition of this or any other tax without the consent of the "Eight Men"—a sort of assembly representing the people—would meet with little favor, he endeavored to propitiate the brewers by permitting them to sell beer to tapsters at twenty florins per tun, an increase over the old price almost covering the amount of the tax. The brewers, nevertheless, stoutly refused to pay the excise, and based their refusal upon the ground that the tax was imposed against the will of the representatives of the people and, therefore, contrary to what they conceived to be an inalienable right of every burgher. While their opposition to a government without the consent of the governed may not have been very clearly defined, the stout burghers of the colony fully understood that taxation without the consent of the taxed was an absolute wrong.

The best historians accord in the opinion that the attitude of the brewers, at that stage of the political development of the Colonies, deserves the utmost praise and reflects all the more credit upon them, because the inducements held out to them by Kieft in the form of a permission to increase the price of their product, might have prompted them to yield, if they had valued their profits more than the political rights of their fellow citizens. The historian O'Callaghan, in his *History of New Netherland*, expresses this view in these words: "Kieft had no idea of being thwarted by such constitutional scruples. Judgment was given against the brewers, and thus another victory was achieved in New Netherland over popular rights."

In all likelihood, the brewers expected that the protest which the Eight Men had openly raised against the excise would enable them to maintain their refusal to pay; but while this expectation may have had the effect of inspiring them with a degree of temerity which would otherwise not have been aroused so readily, it detracts not a particle

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from the praiseworthiness of their action. At all events, if they calculated upon any leniency on Kieft's part, they reckoned without their host; for that arbitrary ruler not only disregarded the remonstrances of the Eight Men and insisted upon payment of the tax, but he even confiscated the whole stock of beer in the cellars of the recalcitrant brewers and gave it to the soldiers—partly as a prize and partly, no doubt, as an incentive to effective execution, on their part, in the event of a popular demonstration. The brewers lost their beer and their case, but they were lauded and they made a memorable bit of history as the champions of popular rights.

**MEN OF
WORTH AND
SUBSTANCE**

We may be permitted to digress a little (though such digression must necessarily carry us beyond the period of Kieft's administration) in order to mention a few of the many Colonial brewers whose names are familiar to every New Yorker, even to this day. William Beekman, brewer, was successively schepen, burgomaster of New Amsterdam for nine years, vice-director of the Colony on the Delaware, sheriff at Esopus, alderman, and again sheriff under English dominion—holding office, with some interruption for forty years. He continued the brewery of George Holmes, built in 1654, and died in 1707 at the age of 84. Beekman Street is named after him, and also (it is claimed) William Street. Peter W. Couwenhoven, brewer, was schepen in 1653 and 1654, and again in 1658-59 and 1661-63. Nicholas and Balthazar Bayard, brewers, held office between 1683 and 1687; the former as alderman and mayor, and the latter as alderman. Petrus Rutger, brewer, was assistant alderman from 1730 to 1732. The Rutgers were a family of brewers. Jean Rutgers, their forefather, had a brewery in 1653, built probably earlier. Alice, daughter of Anthony Rutgers, married Leonard Lispenard, and one of the latter's sons (Anthony) owned extensive breweries. The name of Lispenard, says a local historian, is merged

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in the families of Stewart, Webb, Livingstone, Winthrop, etc. John DeForrest, brewer, was schepen in 1658. Jacob Kip, brewer, was schepen from 1659 to 1665, and again in 1673. His ancestors, the DeKypes, belonged to the oldest nobility of the Bretagne.

Oloff S. Van Cortlandt, brewer, was burgomaster from 1653 to 1663 (thirteen years of continuous service), and alderman in 1666, 1667 and 1671. If certain genealogical charts (usually considered reliable) may be trusted, Van Cortlandt was a descendant of the Dukes of Courland, Russia. He had a brewery in Stone Street, which in Dutch days was appropriately named Brouwer, *i.e.*, Brewer Street. His daughter, Maria, married Jeremiah Van Rensselaer—lord of the colony of Rensselaerwyck who also was founder of a brewery, namely, the one at Beverwyck, before adverted to. Aert Teunison, a most influential man in his days, established the first brewery at Hoboken, and made beer for his neighbors until 1648, when he was killed by the Indians. Michael Janson, the progenitor of the large Vreeland family, was the first brewer at Pavonia, in 1654. Jacob Van Vleck, brewer, was alderman in 1684, 1685 and 1686. Martin Cregier, captain of the military company—a man of considerable importance, who commanded several exploring parties and subsequently became burgomaster—was the proprietor of a tavern opposite Bowling Green in 1653, and doubtless also practiced brewing.

We may now close this very incomplete list of prominent Colonial brewers with the mention of one whose name is, and always has been, of uncommon interest to historians, seeing that he was the first white male born in New Netherland. Jean Vigne held the office of schepen during three terms. He followed the threefold occupation of brewer, miller and farmer, and owned a tract of land, the site of his brewery, near Watergate (present Wall Street).

CHAPTER III.

EXCISE IN NEW NETHERLAND.

WE will now return to our narrative. At the time of the brewers' protest against the excise, the number of tapsters in New Amsterdam and the surrounding country was very large; but, singular as it may appear, there was but one tavern for the entertainment of strangers, and this a clumsy stone building which Kieft had caused to be erected at the Company's expense in 1642. In that patriarchal spirit which characterized all his acts, he assumed a close supervision over this primitive hotel, the patronage of which must have been all the more profitable because the Governor, to prevent the influx of runaway servants and culprits, had prohibited the entertainment of strangers by private families for more than one night without his permission. This stone tavern was subsequently enlarged and fitted up for use as a Stadthuis (City Hall). During the remainder of his administration Kieft gave no further trouble to the brewers; but the tax continued to be collected.

When Kieft was recalled, and succeeded by Governor Stuyvesant, the abolition of the excise was asked for, but was peremptorily refused. The hope that the excise would be abolished had been raised by Kieft himself, who had promised the Eight Men that upon the arrival of his successor a change would be effected. Stuyvesant, however, had no such intentions; on the contrary, he at once imposed new taxes, inaugurated a system of excises and licenses, and introduced a number of innovations

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designed to bring the business under better control. Thus, he ordered the complete separation of brewing and tapping, forbidding brewers to retail and tapsters to brew beer. Unlike his predecessor, he desired an improvement in the accommodations for travellers, and therefore ordered that tapsters and tavern-keepers should build better houses for the entertainment of guests. But as the number of tapsters and spirit venders had already grown too large, he refused to license new places. Stuyvesant's own report shows that, in 1651 or thereabouts, nearly the just fourth of the City of New Amsterdam consisted of brandy-shops, tobacco or beer-houses. This was certainly an exaggerated statement; yet from all other evidences it must be inferred that the consumption of liquors was enormous. We find, at a fair calculation based on the two essential factors, viz.: amount of excise and population, that the tax paid for drink amounted to four guilders for every man, woman and child of the community.

GOVERNOR It will be readily understood that the
STUYVESANT'S law prohibiting brewing by tapsters
REGULATIONS yielded additional advantages to the
brewers proper, and that the tapping of beer by brewers in violation of the ordinance, occurred very rarely. Yet so anxious was Stuyvesant to prevent evasions of his orders that he even forbade brewers to sell or give beer by the small measure to anyone—even to their boarders, “who, they pretended, came at meal times to eat with them.” By way of additional safeguard, he required the brewers to obtain a permit from the Secretary of the Colony whenever they wished to remove beer from their brew-houses.

To enforce all these new laws and ordinances, promulgated for the sole purpose of securing as nearly as possible the full amount of taxes due the exchequer, Stuyvesant appointed inspectors, gaugers and revenue supervisors. Nevertheless, either on account of his natural

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distrustfulness or because he wished to set a good example to his officers, he frequently visited and inspected the taverns himself to make sure that his laws were obeyed. Money still being scarce, he increased the excise again and again, without permitting the brewers to raise the price of their product, until the beer-drinkers loudly complained that with every increase of tax, the brewers made their beer "thinner and poorer." These complaints finally induced him to adjust the prices of beer in accordance with the increased cost of production, and to prescribe minutely the quality of the article.

It may interest the reader to learn that beer, in those days, was made either of malted barley, wheat or oats, and that whenever there was a scarcity of any of these cereals, the lawmakers usually forbade the malting of it. Here, as in the New England colonies, the law provided for three grades of beer: the first grade requiring six bushels of malt for every hogshead; the second, four bushels; the third, two bushels. Complaints about the quality of beer were sometimes investigated by a court composed of the schepens and burgomasters. In 1655, when one of the burgomasters and two of the schepens were brewers, this court, being engaged in the consideration of such a complaint, adjourned and personally sampled the beer in dispute; whereupon they gave judgment in accordance with their own evidence.

CONFLICT WITH THE PATROON

Before the administration of Stuyvesant, the Patroons regulated the liquor traffic in their own way. In Rensselaerwyck, the condition of affairs now became somewhat muddled, as will presently be shown, in consequence of the conflict of authority between the Patroon and the representatives of the Director of the Colony. The manner in which the Patroon first regulated the traffic was simple enough.

As we have already stated, he established a brewery with the exclusive privilege of supplying all licensed

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retailers with beer; but he permitted private individuals to brew whatever beer they needed for their own families. Subsequently, however, other brewers were licensed. In the dorp (village) of Beverwyck—the present Albany—which had sprung up in the immediate neighborhood of Fort Orange, and, in fact, throughout the colony, permission to build houses, establish stores, factories, shops, beer-houses, etc., had to be obtained from the Commissaries to whom the government was entrusted. This permission had to be paid for in some instances, while in others it was given gratuitously.

As a rule, the license to brew beer for sale did not belong to the latter category; on the other hand, the fee for such license seems to have been very high. In 1647, Jean Labadie, formerly an assistant commissary, applied for permission to build a brewery, which was granted on his paying a yearly duty in the shape of beaver, amounting in value to about eighty dollars. Many other licenses had been granted since then, and the number of tapsters seems to have been very large; good reasons why the Court at Fort Orange, representing the Stuyvesant Government, should insist upon the payment of the tax.

The Patroon, however, frustrated the first attempt to collect the excise and issued a proclamation expressly forbidding the brewers and tapsters to pay any duties. The tapsters, of course, readily obeyed this order. Finally, Stuyvesant ordered the Court at Orange to arrest one of the refractory tapsters, named Ariensen, and send him to Manhattan. The clerk of this court, Johann de Decker, successfully carried out this order by a ruse. He invited the unsuspecting Ariensen to his house and detained him, in spite of the protests of Van Rensselaer and the "schout" of the colony, and notwithstanding the offer of the former to vouch for the appearance of the prisoner. Ariensen, although compelled for security's sake, to sleep in De Decker's bed and to be watched over by a servant,

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managed to escape and took refuge in the house of Van Rensselaer. De Decker pursued the fugitive with the intention of re-apprehending him, but was met by a body of armed men who appeared determined to use force of arms, if necessary, to prevent the officer from fulfilling his duty. Bloodshed would inevitably have followed an attempt to recapture Ariensen, and, to avoid this, the officer retired, reporting the failure of his mission to the Director and asking that more soldiers be sent with him, having "among them one or two who are not nice about taking hold of a man."

As was to be expected, Stuyvesant resorted to measures which soon rendered the Patroon amenable to law and order, and the revenues derived from tapsters alone rose, within one year, from an insignificant sum to 4,200 guilders, in 1657. Nothing noteworthy occurred thereafter during Dutch dominion.

Nicolls, the first English Governor of New Netherland, paid some attention to brewing. Among the laws which he submitted to the Assembly convened at Hempstead, and which are known as the Duke of York's Laws, was one providing that no person should be allowed to brew beer for sale without having "sufficient skill and knowledge in the art and mystery of brewing,"* and otherwise regulating the trade with a view to securing wholesome beverages. He also introduced the fee-feature into the license-system governing retailers. In his endeavor to conciliate the conquered Dutch burghers, he, however, refrained for a time from strictly enforcing this rule and other excise-regulations contemplated by his principal. It was not until 1670 that he gave peremptory orders for the collection of the excise.

From the date of the recovery of the Colony by the Dutch up to the second surrender to the English (1674),

*The first regular brew-master (in the modern sense of the word) was probably R. H. Vansoest, who came to Albany in 1635 to take charge of the Patroon's brewery.

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the liquor traffic received but casual attention in New York; and for many years after the re-establishment of English supremacy, the annals of the Colony contain no indications of great progress in brewing.

In the succeeding chapters the further development of brewing in New York receives sufficient attention to justify our closing this chapter at this point so as to avoid useless repetitions, and to prevent the overtaxing of the reader's patience.

CHAPTER IV.

BREWING IN PENNSYLVANIA.

IN New Castle and Delaware River the Duke of York's laws remained in force until 1682, when they were superseded by the acts passed by Penn's Assembly. William Penn introduced brewing into Pennsylvania at a very early date. He built a brewery near his house at Pennsbury, and all his acts and ordinances indicate a decided preference for malt liquors. It was under his fostering care that the "infant industry" prospered for a time and made Quaker beer quite famous.

To the excellent quality of this beer and the abundance of it may be attributed the fact that brewing had not, at that time, gained a foothold in West New Jersey, the colonists there drawing their supply from the Quaker brewers in the adjoining Colony. Deputy-Governor Gowen Laurie, one of the proprietors of West New Jersey, made an effort, in 1683, to have a brewer sent to him from England. A malt-house had already been established at Amboy, "but", wrote Laurie, "we want a brewer, and I wish thou wouldst send one to set up a brew-house." The Swedish settlements on the Delaware seem to have reaped a sufficient harvest from the vines which they had planted to secure them an ample supply of wine.

It seems that all the colonists had conceived the idea that it would be very easy to make their new home a wine-country, and it was but natural that the German settlers, by far the greater number of whom came from the Palatinate and the Rhine provinces famed for their wines, should have thought so.

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The seal of Germantown bears a bunch of grapes, among other symbolical devices, and the inscription *Vinum, Linum et Textrinum*; but although the city became famous for its linen, its wine never amounted to much. Here, however, as in Philadelphia and all succeeding settlements, brewing prospered for a while.

When Penn assumed control of his colony, he probably found but a single tavern within his domain, *i.e.*, *The Blue Anchor*, located at what is now known as Dock Street. The records show that with increasing population the number of taverns also increased, and early laws and regulations seem to indicate an excess of supply over demand. A law enacted in 1699 authorized the governor to license taverns and suppress disorderly houses. Subsequently, other regulations, conceived in a spirit of paternalism, aimed at the fixing of prices and of the quality and quantity of food and drink to be served at taverns. From these regulations it appears plainly that beer was considered a regular and indispensable part of every meal, and this fact explains why brewing flourished in the early part of the colony's history.

Not all beers, however, were of the kind referred to before. Neither domestic malt nor hops could be procured in sufficient quantities to supply so large a demand and as a consequence the colonists fell back upon the manufacture of what might be styled a new kind of mead. We have it on the assurance of Penn himself that "molasses when well boiled with sassafras or pine infused into it" makes a very tolerable drink.

Beer-drinkers probably preferred hops and malt, and when the short-sighted policy of the lawmakers imposed exorbitant duties upon imported hops and malt before enough of these materials could be raised at home, and at the same time fixed the price of domestic malt-beer and its quality at a rate which made the business unprofitable, brewing naturally declined, and in the logical course

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of things molasses was then transformed into rum or the latter article imported in the place of the former.

The evil effects of this policy must have become manifest almost instantaneously for as early as 1713 Governor Gordon deplors the decadence of brewing and the almost total discontinuance of the cultivation of hops and barley. After various futile experiments to remedy the evil the lawmakers in 1722 imposed a duty upon molasses, primarily to discourage the manufacture of rum, and enacted several laws designed to encourage the brewing of beer made of grain (not necessarily barley) and of hops. One of the principal inducements was the entire separation of the sale of beer from the liquor traffic and the exaction of a very low license-fee from the keepers of ale-houses. The use in brewing of molasses, sugar or honey was absolutely forbidden, and both the brewers and the brewing tavern-keepers were compelled to give security (\$500.00) for the faithful observance of the provisions of the act relating to permissible materials.

The law distinctly sets forth that one of its objects is to induce "the brewers to take special care to bring their beer and ale to the goodness and perfection which the same was formerly brought to, that so the reputation which then was obtained and is since lost, may be retrieved."

The same law directs that the proper officers in fixing the prices of commodities "shall allow higher prices than common to be taken for such beer and ale as shall excel in quality." Economically considered, the laws fixing the price as well as the quality of the commodity, frequently without regard to cost of raw material and labor and almost always without due consideration of the condition of crops and the market, was a serious error and the very text of the quoted Act seems to indicate that the lawmakers had begun to understand the far-reaching effect of this blunder.

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One other object of the law, as stated therein, was to encourage the cultivation of hops and of wheat and barley. We know that Pennsylvania ultimately became an important grain-growing country, but we also know that partly as a result of such unwise legislation as has already been referred to, the surplus grain found its way into distilleries. Subsequent legislation, such as the act forbidding the sale of liquors, *excepting beer*, to iron-workers within two miles of a foundry, or the one permitting only the sale of beer and cider on the muster-fields of the militia, had little effect upon the drinking habits of the people, in many parts of the colony. In 1733 the *Pennsylvania Gazette*, dilating upon this condition of things, stated that Philadelphia women "otherwise discreet, instead of contenting themselves with one good draught of beer in the morning, take two or three drams, by which their appetite for wholesome food is destroyed."

Between the rum or molasses imported from the West Indies in the earlier periods and the subsequent spread of rural distillation, brewing had scarcely any chance of a healthy development; nevertheless, it continued to be practiced in the principal towns, particularly where the German element preponderated. It was an economic fallacy of the age that in grain-growing countries agriculture could not possibly prosper without the distillery—a fallacy which prevailed in the northern countries of Europe and could not but find universal approval during the pioneer period of a new country where the means of transportation were exceedingly scant. In the rural districts the number of stills increased in proportion to their remoteness from the centers of civilization and in some parts whiskey actually took the place of money as a medium of barter, just as in a previous period rum had been the main stay of foreign commerce.

In 1790 there were no less than 5,000 stills in operation in the State of Pennsylvania, that is to say, one still

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for every 86 of the population. Long before this period public attention had been directed by public writers and speakers to the temperate drinking-habits which prevailed in most of the German settlements, and naturally enough, on all such occasions, brewing was advocated as a means of promoting temperance.

In his "Account of the manners of the German inhabitants of Pennsylvania," Benjamin Rush dwells with particular emphasis upon the fact that these people, whom he praises for their probity, frugality, economy, love of liberty and country, commonly drink beer, wine and cider, and he makes this fact one of the principal arguments in favor of his famous temperance scheme. Many other writers then and thereafter coincided with him in this view; among them Tench Coxe who "considered it a fact strongly in favor of the industry, sobriety and tranquillity of Philadelphia that its breweries (at the beginning of the nineteenth century) exceeded, in the quantity of their manufactured liquors, those of all the seaports of the United States."

This may seem all the more remarkable on account of the growth of the distilleries after the abolition of the first Federal tax on spirits, brought about in a measure by the Whiskey Rebellion; but it will not in any way appear astonishing, if the character of the population of that city be borne in mind.

Philadelphia beer had retained its reputation for excellent quality even during the era of free whiskey, when brewing throughout the country seemed to be in the last stages of hopeless decline; but it must not be supposed that in even this city of beer-drinkers the production kept anything like an equal pace with the increase of population.

Enough has already been said on this subject in the chapters on brewing in New England and more will be said in the two chapters on the decline of brewing and on

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the rise of lager beer to render unnecessary a more detailed account.

In 1810 there were in operation in Pennsylvania 48 breweries with an aggregate annual output amounting to 71,273 barrels; New York had only 42 breweries and an annual production of 66,896 barrels. The output of all the other States of the Union amounted to but 44,521 barrels. Pennsylvania remained in the lead during about 20 years, when it had to yield first place to New York. The marvellous growth of brewing in the West did not change the relative position of these two States in point of production, but it changed completely the status of the industry, as we shall presently show.

CHAPTER V.

BREWING IN THE SOUTH.

IN the Southern provinces, unfavorable soil and climate conspired with other unpropitious circumstances to exclude brewing almost entirely. Sporadic attempts to introduce it were quickly frustrated, no less by reason of a lack of suitable raw material than on account of a want of skilled brewers; and also, perhaps, because domestic spirits could be had more cheaply.

 In Virginia, as early as 1652, one George
VIRGINIA Fletcher had obtained the exclusive right to "brew in wooden vessels, which none had experience in but himself;" but his product evidently found little favor, for we read no more of him or his wooden vessels.

From the instructions given to the governors of Virginia by the London Company and from other equally direct evidences, it is to be inferred that the repression of excesses in drinking, and the creation of agricultural conditions favoring the home-production of wine and beer were the two principal objects of the government's care. The latter project, for reasons already indicated, failed of realization.

The common beverages then used by the people were imported wines, strong beer and ardent spirits, and domestic beer, of which latter an inconsiderable quantity was brewed in the households of the colonists. The former drinks were retailed not only by keepers of ordinaries (taverns), but also by victuallers and merchants. Debts for wine and ardent liquors were excluded from the obli-

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gations pleadable in court. No mention is made of beer in this connection, and from the exception thus made it is fair to conclude that a discrimination in favor of malt liquors was intended. Without further corroboration this inference might be exposed to the reproach of being far-fetched; but, fortunately, such corroboration is not wanting. It is contained in an act, passed in 1644, which provides, among other things, "*that no ordinary keeper or victualler be permitted at all to sell or utter any wine or strong liquor BUT STRONG BEER ONLY.* And that, according to order of the first of August, 1643, no debts made for wines and strong waters, shall be pleadable or recoverable in any court of justice in this Colony."

A double discrimination is here made in favor of malt liquors, viz., one in explicit terms, permitting the sale of strong beer only, and an implied one in the clause which excludes debts for wines and strong waters (not for beer) from the list of obligations legally pleadable. The fact is that beer was considered an indispensable part of every regular meal.

Among the "staple commodities" sought to be encouraged by law, in 1658, we find hops and wine; the premium on the latter being ten thousands pounds of tobacco for "two tunne of wine" raised in any colonial vineyard.

The importation of English malt and malt liquors increased rapidly, because domestic brewing and malting remained in an unsatisfactory condition. Roger Beverly gives the following interesting description of the manufacture and use of drinks at about this time:

"The richer sort generally brew their small beer with malt, which they have from England, though they have as good barley of their own as any in the world; but for want of the convenience of malt-houses, the inhabitants take no care to sow it. The poorer sort brew their beer with molasses and bran; with Indian corn malted by

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drying in a stove; with persimmons dried in cakes, and baked; with potatoes; with the green stalks of Indian corn cut small and bruised; with pompions; and with the *batates canadenses*, or *jerusalem artichoke*, which some people plant purposely for that use, but this is the least esteem'd of all the sorts before mentioned.

"Their strong drink is *Madeira* wine, which is a noble strong wine; and punch, made either of rum from the *Caribbee* Island, or brandy distilled from their apples, and peaches; besides *French brandy*, wine and strong beer, which they have continually from England."

In 1748, the Sabbath question first entered into legislation on the liquor traffic. No mention is made of the subject in any of the preceding acts, not even in those passed during the Cromwellian reign, when the Puritan idea, that the State should by legislative enactment enforce complete inactivity and abandonment to spiritual contemplation on Sunday, had gained popular favor. The act passed in that year contained the following clauses referring to the Sabbath:

... "If any ordinary-keeper shall in his house permit unlawful gaming, or suffer any person or persons to tipples in his house, or drink any more than is necessary, on the Lord's day, or any other day set apart by public authority for religious worship, . . . the court may disable such offender from keeping ordinary thereafter, until they shall think fit to grant him a new license, or may restore him to keep ordinary upon his former license, as they shall see cause."

In 1769 the cause of temperance achieved two signal successes; one consisting in the revocation of the import duty on beer, and the other in the renewal of legislation encouraging viticulture. The idea of fostering the manufacture of malt liquors found many advocates at this time, and there can be no doubt that many of the best Americans strove, by precept and example, to bring about a change of drinking habits, in the manner indicated, long before the passage of the two acts just cited.

As to the encouragement of wine-making in Virginia,

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we have seen that it dates back to the earliest periods of Colonial legislation, and that then it was suggested by the abundance of grapes found everywhere by the first settlers. Neither these early attempts nor subsequent efforts led to any lasting results, because viticulture was not understood by the English colonists, while the French vintners, who, on uncommonly favorable terms, had been induced to emigrate to Virginia on the condition that they plant vineyards and instruct the colonists in viticulture, failed to do what was expected of them, finding the planting of tobacco to be more profitable.

The sporadic attempts to encourage the manufacture of malt liquors was equally unsuccessful. The inducements offered to hop growers, even if they had been sufficiently alluring to tempt farmers to abandon the profitable cultivation of tobacco, could not have over-balanced the many difficulties which climate and the absence of industrial enterprise placed in the way of brewing. There was another drawback, however,—the cheapness of domestic spirits, which were not burdened by internal taxes.

Under circumstances and conditions similar to those prevailing in Virginia, the brewing trade in this Colony lagged far behind the comparatively rapid progress achieved in other respects. Enterprising Dutchmen from the settlements on the Delaware had intended years before to emigrate to Maryland for the purpose of introducing the brewing industry there; but a want of capital and other obstacles had deterred them from carrying out their plans. In 1676 there were no malt-houses in the province, and the planters, chiefly engaged in raising tobacco, saw no inducement to plant barley or any other cereal, beyond what they needed to make bread with. The poorer people brewed small beer from Indian corn dried in common stoves, and from molasses mixed with bran. As beer constituted an indispensable part of every meal, it is reasonable to assume

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that tavern-keepers brewed a similar beer, unless they could obtain malt either from England, or from one of the other American colonies.

There appears to have been no lack of orchards at this time, and many planters made their own cider, and also brandy from apples. The fact that the law against selling liquors on Sunday contained a separate clause enjoining owners of orchards not to violate the said act, proves that these persons made a practice of selling their products.

Like their colleagues of Virginia, the lawmakers of this Colony honestly strove to encourage the domestic manufacture of fermented beverages, and, also like the Virginians, they believed that nothing would serve this laudable aim better than to make the domestic product cheaper than the imported article.

Of curious interest is a resolution of the Assembly, embodied in an act passed in 1674, declaring that "noe rates of prices of anie accommodacons be set or ascertained, but such only as are of absolute necessity for sustaining and refreshing travelers, that is to say, man's *meat, beer and lodging.*"

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The great difference between liquor licenses and wine licenses, in the matter of fees, in Carolina, shows how consistently the lawmakers adhered to the policy of favoring domestic viticulture. Even before the time when the immigration of the French refugees began to assume considerable proportions, wine made in the Colony from native grapes had been sent to England, where "the best palates well approved of it." It was then the general impression that if the planters continued to "prosecute the propagation of vineyards as industriously as they had begun it, Carolina would in a short time prove a magazine and staple for wines to the whole West Indies." The proprietors of the Colony had sent to the planters choice European grape-vines for trans-

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plantation, and encouraged wine-making in many ways. The only impediment in the way of a rapid development of viticulture appeared at that time to consist in the want of skilled vintners. The French refugees, it was hoped, would supply this want, and Carolina would in the end rival France and the Rhenish countries in the quality of her wines. These expectations were revived when the first colony of Switzers was planted in the province, and again, many years later, when the poor Germans, whom Stumpel had allured from their homes on the banks of the Rhine, were settled at Londonderry. Unfortunately for the cause of temperance, these expectations were not realized, owing to the cheapness of ardent spirits, which, before the end of the first half of the eighteenth century, had completely changed the tastes and habits of drinkers. That this was the real cause of the failure of every effort to foster viticulture, appears not to have been understood at the time. Indeed, as late as 1779 Alexander Hewitt, in his history of the Colony, expressed the belief, that the repeated failures were mainly attributable to the want of encouragement. "European grapes," he wrote, "have been transplanted, and several attempts made to raise wine; but so overshadowed are the vines planted in the woods, and so foggy is the season of the year when they ripen, that they seldom come to maturity. But as excellent grapes have been raised in gardens where they are exposed to the sun, we are apt to believe that proper methods have not been taken for encouraging that branch of agriculture, considering its great importance in a national view."

No methods whatever could have made viticulture a favored occupation, so long as cheap rum monopolized the drink market. Indeed, after the rum habit was once firmly established, it would have been somewhat difficult, even under the most favorable conditions, to introduce either brewing or wine-making, because, owing to the

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change in the taste of drinkers, there would have been no demand for either beer or wine. If during the first century, or even half century, rum had been as difficult to obtain and consequently as expensive as European spirits, the colonists would in all probability have brought viticulture or brewing to that stage of development which would have answered the domestic demand. We have it on the authority of a contemporaneous writer, that as early as 1680, Mr. Lynch, "an ingenious planter," had raised "barley of which he intended to make malt for brewing English beer and ale." He had all the necessary utensils for that purpose, and would probably have succeeded himself and found successful imitators, if it had not been for the rapid development of the rum traffic.

General Oglethorpe's description of the effects of the rum habit in the older settlements induced the trustees of this province to pass "an act to prevent the importation and use of rum and brandies in the province of Georgia, and any kinds of spirits or strong water whatsoever." Far from being identical with Prohibition in the modern sense of the term, this act had for its object neither more nor less than a change of drinking habits, to be effected by the substitution of wine and beer for the drinks prohibited. The same trustees who passed the prohibitory act, sent over large quantities of Madeira wine and strong beer; and Oglethorpe exerted himself in furthering domestic brewing and viticulture, which he conceived to be the only practicable means of making the people temperate. In this, he merely reflected, as we have seen, the opinions of the early lawmakers of nearly every Colony; but he went further in carrying out this idea than they did—in fact, he went too far, and thus overreached his object.

At the present day, the experiment made in Georgia over one hundred and sixty years ago, is highly interesting because it confirms the conviction, entertained by all

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those who have studied the drink question, that no temperance efforts can ever be successful unless they are accompanied by all the conditions that favor abundant production and consequent cheapness of good and palatable fermented drinks. Exert himself as he would, Oglethorpe could not supply beer or wine in such quantities and at such prices as to ensure the success of his measure. In the settlements of the Salzburgers the taste of the people helped to further his object; but even there, the drink called beer, which was made of molasses, sassafras and the tops of fir trees, proved but a poor substitute, scarcely calculated to satisfy a German palate. Oglethorpe fully understood that a steady and abundant supply of cheap beer was absolutely required to render the prohibitory act effective. In a letter to the trustees written at Fredericia,* under date of October 7, 1738, in which he urgently requested that fifty or sixty tuns of beer from the brewery of Hucks at Southwark be sent him, he said: "Cheap beer is the only means to keep rum out." It is extremely doubtful, whether under then existing circumstances cheap beer would have sufficed to keep out rum. There were other considerations which militated against Oglethorpe's purpose. His own people were dissatisfied with the law; they conceived it to be detrimental to their material interests, inasmuch as it debarred them from trading with the West Indies, "an excellent and convenient market for their lumber," as Hewitt has it. Besides, they were of the opinion, held by many competent judges in our time, that the climate of the province rendered the use of rum advisable from a sanitary point of view. The Carolinians could not be prevented from bringing rum into the Colony, although after the first altercation, which arose on account of this practice, they promised to desist

*The following curious episode of Oglethorpe's journey to Fredericia is reproduced in C. C. Jones' "Dead Towns of Georgia": "Mr. Ogelthorpe accompanied them in his scout-boat, keeping the fleet together, and taking the hindermost craft in tow. As an incentive to unity of movement, he placed all the strong beer on board one boat. The rest labored dilligently to keep up; for, if they were not all at the place of rendezvous each night, the tardy crew lost their rations."

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from it. Hence rum could easily be had; and it is not difficult to understand that so long as good rum could be had cheaply, men accustomed to ardent liquors would not at short notice make poor beer their everyday beverage. Even Oglethorpe's immediate *entourage* could not be induced to discard rum for the questionable drink which he furnished them from his brewery at Jekyl. "Settlers and officers," says McCall, in his History of Georgia, "were known to retire from the presence of the general into an adjoining apartment in order to drink." But, worse than all, the magistrates themselves, who had the power to license ale-houses, and were instructed to prevent and punish the sale of ardent spirits, engaged in the unlawful traffic, or openly connived at it.

No more need be said to show that the act was practically a dead letter, long before its repeal in 1742. A modern historian, the Rev. William B. Stevens, a sincere friend of true temperance, in reviewing Oglethorpe's efforts to substitute wine and beer for ardent spirits, says that "Georgia was designed to be a temperance colony, although no temperance movement had roused up the nations to the woe of drunkenness." And again: "Thus did temperance strive with charity to lay pure foundations, and build up a spotless superstructure of colonial virtue; but it was a movement too much in advance of the age, and too much opposed to the already settled habits of the colonists, to meet with the success it merited." A temperance colony with pure foundations and a spotless superstructure of virtue by means of the substitution of fermented drinks for ardent liquors!

The Salzburgers were not the only people of temperate drinking habits whom Oglethorpe settled in his colony. Before them had come the Moravians—mostly beer-drinking Germans—men and women of rare virtue and sincere piety, who embarked for Georgia on the same ship with the Governor and with John Wesley, the

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founder of Methodism, at present the creed of nine million Americans. Wesley, to quote Robert Southey's words "was so deeply impressed with the piety, simplicity and equanimity of these, his shipmates," that he applied himself to the study of the German language in order to be able to converse with them more freely. He had seen them frequently during their tempestuous voyage, facing the menace of death with the unflinching calm and resignation of their absolute "Gottvertrauen," and it was doubtless on this voyage that he conceived the desires which, upon his return to England, made him a disciple of Peter Boehler, then on the eve of his departure for Georgia, and prompted him to visit the Moravians in Germany.

Neither the Moravians nor the Salzburgers of Georgia seem to have received at the hands of modern historians their due measure of appreciation. The somewhat indulgent contempt with which Jones in his "Dead Towns of Georgia" occasionally refers to the Salzburgers reveals a total lack of appreciation of these pious, upright and sturdy people whom one is strongly tempted to style the German Huguenots. Like their French co-religionists they were driven out of the land of their birth by the intolerance of tyrannical rulers, and, sacrificing all they possessed for the sake of their faith, they sought homes in foreign lands. Both were welcomed and received with open arms by the father of Frederick the Great, who colonized seventeen thousand of the Salzburgers in his provinces and would gladly have sheltered them all; but a part of the exodus was diverted to other lands and of that part Oglethorpe secured a few communities with their pastors whom he settled in Georgia.

Goethe immortalized the Salzburgers in his beautiful epic poem "Hermann and Dorothea,"—"the German's pride and poesy's pearl"—and in his history of Frederick the Great, Carlyle devotes one of his most interesting

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chapters to them; but what ought to bring them nearer to the American heart is the fact that Whitefield and Wesley called them colonists of the best description, dwelling together in perfect peace and harmony, without courts of law, referring all little differences to their ministers whom they loved as their fathers. Wesley said of the Georgia Moravians (all beer-drinking Germans) that they were "the only genuine Christians he had ever met." Whitefield said of the Salzburgers' spiritual leaders that he had "not often seen such pious men." No greater praise can be conceived than that which Bancroft, America's master historian, bestows upon the Salzburgers in the second volume of his *History of the United States*. Jones' veiled slur about these people's eagerness to get their beer shows a petty bias which seems to crop up regularly whenever American historians lose sight of the close relationship that exists between the Anglo-Saxon and their Germanic cousins of other lands.

Unbiased minds will appreciate Oglethorpe's profound regret at his failure to carry out his plans, all the more so, if the present condition of things in Georgia be considered.

In the "dead towns" of that State a tombstone may here or there testify to the mundane existence of the Salzburgers; more rarely, perhaps, a German patronymic, corrupted or Anglicized, may remind one of these people; but that is practically all that is left of them. In Prussia, however, their brethren flourished, forming a most useful, prosperous and happy part of the population, who, as Carlyle puts it, had all reason on their annual thanksgiving days "piously to admit that Heaven's blessing had been upon that King and upon them."

From a general point of view, considering the South as a whole, it may be said that brewing had gained no firm foothold there during the Colonial period in spite of the fact that, besides the Salzburgers, there were several considerable German and Swiss settlements on the Neuse

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and Cape Fear Rivers in North Carolina, on the Edisto River in South Carolina, and in many parts of Virginia.

In the middle of the last century, and in a few isolated cases somewhat earlier, brewing received a strong impetus through the influx of German immigrants, but the climate and other countervailing influences retarded its progress, as we shall presently see, until at a much later period improvements in the art itself and the perfecting of artificial refrigeration enabled the Southern brewer to carry on a profitable business adapted to the peculiar conditions of his environment.

In the chapter entitled "The Rise of Lager Beer," it will be shown what disasters have befallen Southern brewing under the operation of recent laws.

CHAPTER VI.

DECLINE OF BREWING.

UP to the Revolution the decline of brewing in the Colonies continued until scarcely a vague recollection of its former flourishing condition lingered in the minds of the people. Here and there, widely scattered over an immense extent of territory, a few brew-houses whose product had acquired an uncommon reputation—like the porters and ales of Philadelphia—remained in operation; but their output was infinitesimal as compared with the quantities of other inebriating liquors produced and consumed in the country. True, the lawmakers improved every available opportunity to hold out inducements to brewers and never failed on such occasions to lament the total decay of the industry; but however alluring the exemption from duties and excises, premiums on domestic hops, and the protection of malt and beer may have been, they were insufficient to counterbalance other economic factors—such, for example, as the cheapness and popularity of rum, which the legislator could not neutralize.

Hence, with the exceptions already adverted to, brewing relapsed into the primitive state in which we found it at the beginning of its Colonial career, again becoming a domestic industry wherever a lingering taste for malt beverages induced the people to set up the discarded kettles, and to brew their own beer, from time to time. In like manner, tavern-keepers recommenced brewing in order to supply those of their customers who still preserved a taste for beer; and the quantities thus brewed

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for home consumption, in the narrowest sense of the term, may not have been inconsiderable; but we have no way of determining, even approximately, how large this production was. Such beers were not, of course, of a very good quality; and this explains the well-authenticated fact that the few regular brewers who still continued to brew were overrun with orders from the tapsters. Of a certain Quaker brewer it is reported that, toward the end of the eighteenth century, he used to hold receptions in the old Rainbow Inn, in Beekman Street, New York, whither came his customers, with hat in hand, to pay their respects and solicit a supply of ale!

During the war, when commercial intercourse with England was completely shut off, and the importation of merchandise from other countries hampered by many dangers, domestic brewing revived in a measure; but the unsettled state of affairs prevented anything like a complete resuscitation of the trade. From all we can learn it appears that the increased activity in this field of labor was confined to an effort to produce the quantities of malt liquors which before the war had been imported from England; but even this object was not, in all probability, fully accomplished, because other more pressing needs confronted the struggling people.

For a short time after the re-establishment of peace, the slight impetus thus given to brewing derived an additional force from a pretty general movement in favor of malt liquors, based alike upon moral considerations and economic requirements. We refer to the movement begun by Dr. Benjamin Rush and carried forward by a strong organization for many years after its inauguration. It was during this period that many small breweries were erected in the towns along the Hudson in the State of New York, and in Pennsylvania. Philadelphia, where the movement referred to originated, at once became the greatest brewing city in America, the brew-houses there

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exceeding in number and the quantity of manufactured beer, those of all the sea-ports of the United States.

PROGRESS That the brewing industry progressed
UNDER considerably in those localities where it
DIFFICULTIES was introduced, shortly before and after the Revolution, is evidenced by a number of circumstances. As early as 1807 the production of malt liquors, according to Gallatin's statement, was nearly equal to the consumption, yet the importation of malt into Pennsylvania had already ceased in 1793; thus showing that the adjuncts of brewing in the large establishments were rapidly being perfected. In Philadelphia, where the agitation in favor of the substitution of fermented liquors for ardent spirits had found most favor, the use of beer had become very general, and soon extended into the larger cities of adjoining states. The state of the brewing industry in 1809-10 appears from the following table, taken from the *Digest of Manufactures*:

States and Territories.	Population.	Beer, Ale and Porter in Barrels of 31½ Gallons.
Massachusetts	700,745	22,400
New York	959,049	66,896
New Jersey	245,562	2,170
Pennsylvania	810,091	71,273
Delaware	72,674	476
Maryland	380,546	9,330
Virginia	979,622	4,251
Ohio	230,760	1,116
Georgia	252,433	1,878
District of Columbia	24,023	2,900
	4,655,505	182,609

The *per capita* production of malt liquors in the States named (the total amount produced being 5,754,737 gallons) amounted to almost one and one-fourth gallons, or, to be precise, to 4.98 quarts. This does not include what in the *Digest* is styled ancient fermented liquors, made of honey—the old German meth, here called metheglin and mead—of which considerable quantities are said to

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have been produced and consumed by private families. Surely, this is a gratifying development of a new industry within so brief a period, and under difficulties of which the present followers of the trade can scarcely form an adequate idea. We quote the *Digest*:

"The difficulty and expense of procuring a supply of strong bottles, and a peculiar taste for lively or foaming beer, which our summers do not favor, have been the principal causes of the inconsiderable progress of the manufacture of malt liquors, compared with distilled spirits. The absence, or the infrequency of malting, as a separate trade, has also operated against brewing in a small way and in families. The great facility of making and preserving distilled spirits has occasioned them exceedingly to interfere with the brewery. The liquor of peaches, hitherto deemed incapable of use without distillation, greatly prevents the use of beer in a very extensive region of our country, where the peach tree grows with the freedom of a weed, and where its fruit is of the best quality. Cider, which is abundantly produced in another very extensive region, rivals fermented malt liquors as a common drink, and as a material for a customary concoction (the cider royal) and for distillation."

The want of bottles was pointed out during the discussions in the first Congress, as an impediment to brewing; but the brewer of the present day will scarcely appreciate the stress laid upon this want, unless a full account could be given him of the character of the malt liquors brewed in those days. Unfortunately, no such account can be obtained; yet a conclusion may be ventured from the statement that, until a Philadelphia brewer of the name of Robert Hare, invented, in 1809, a peculiarly constructed cask and faucet, no method was known of preserving beer, on tap, in partly filled vessels. What the word *preserving* means in this connection will appear from the following passage of the *Digest*:

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"The want of a head, or top of foam, is now observable in the tap beers of Europe, and it is presumable that this object of fancy or taste will not, therefore, be in future deemed indispensable in American tap houses and families. We have been used to consider the want of this foam as an evidence of badness."

That the use of the liquor of peaches prevented the introduction of the brewing industry into the Southern States, is an observation of as much force to-day as it was nearly a hundred years ago; but later experiences have demonstrated the fact, that the influence of climatic conditions, coupled with the high price of ice, is quite as unfavorable to the industry as the abundance of fruit and the tastes of the people. In addition to a scarcity of bottles, there was also a want of cork and wire for bottling purposes. Establishments for manufacturing these three articles were just beginning to grow into some importance, and, of course, demanded protection, which was granted at least to one of them. By the Act of March 27, 1804, quart bottles, which, in order to foster the brewing industry, had theretofore been exempt from the duty upon glassware, were taxed sixty cents per gross; yet the home supply remained behind the demand.

All these impediments, however, would not so materially have retarded the progress of brewing, if laws tending to restrict country distilling could have been maintained; and, from the standpoint of true temperance, nothing could have appeared so desirable as a judicious restraint upon what might be styled rural distillation. All authorities concur in the opinion—confirmed by the voluminous report of the Statistical Bureau of Switzerland—that in Sweden unrestricted distillation in the rural districts rendered intemperance a national vice of consequences all the more pernicious as, owing to the unavoidable deficiencies of a primitive mode of distillation, the spirituous liquors produced were of an extremely ardent nature. But it was precisely in respect to country distilling that our first

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restrictive laws were only partially successful. Those persons who distilled for the trade cheerfully obeyed the laws from the very beginning; and had they not elected to do so, little difficulty could have been experienced in controlling and coercing them. It was not the trade distiller, if this term may be allowed, but the distilling farmer from whom the opposition to excises emanated, and with him, the question resolved itself into one of personal rights, on the one hand, and of a limitation of the taxing power of the Federal Government on the other.

Insufficient, both as to time and mode, as had been the test to which the excise system was subjected, it was, nevertheless, proved beyond question that, coupled with a sufficiently high import duty, it could have fully realized the ethical objects of its framers, if the Government had been able to execute it rigorously, and the people had been willing to live up to it.

At the end of the first decade of the last century rural distilling recommenced with renewed vigor in all grain-producing States. From this time onward the brewing industry developed somewhat more rapidly in Pennsylvania and New York on account of the great influx of immigrants from beer countries; while in the other States it either remained stationary or progressed very slowly, constantly struggling against great difficulties and impediments. The extent of the progress of brewing within forty years, *i.e.*, from 1810 to 1850, is clearly stated in these figures:

1810:	129	breweries producing	5,754,737	gals. beer
1850:	431	" "	23,267,730	"
1850:		Production of beer in Penn. & N. Y.	18,825,096	"
1850:		" " " all other States	4,442,634	"

During all this time, and up to 1842, or thereabout, the beers produced in this country were of the kind known as ale and porter, and some of these had acquired a reputation for palatableness and strength which rendered them formidable competitors of English ales in foreign markets.

CHAPTER VII.

THE RISE OF LAGER BEER.

L AGER-BEER, as a product of American industry, although introduced, as has been intimated, about the year 1842, did not gain popular favor until the decade following its introduction; nevertheless, all authorities agree that it tended even at that time to impart a strong impetus to brewing. As to the exact date of its introduction, and the person by whom it was first introduced, there still exists so much uncertainty that no writer on the subject has ventured to go beyond mere hypothetical assertions. Did we not live in an enlightened age, the mystery in which the origin of American lager-beer is shrouded might add another legend to the many mythical tales which, variously colored by different nations, are current concerning the father of real beer. We say *real* beer, for, although the use of a wine-like beverage, extracted from barley, extends far into the pre-historic ages, *real* beer (that is, the drink known to us by that name) is of more recent origin; yet, as to place and date of the latter, nothing definite can be known.

While some attribute the invention of hopped malt beer to Jan Primus (John I), a scion of the stock of Burgundy princes, who lived about the year 1251, others ascribe it to Jean Sans Peur (1371-1419), otherwise known as Ganbrivius. A corruption of either name may plausibly be shown to have resulted in the present name of the King of Beer, viz., Gambrinus, whom we are accustomed to see represented in the habit of a knight of the middle ages, with the occasional addition of a crown. Popular imag-

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ination, it seems, attached so much importance to beer that in according the honor of its invention, it could not be satisfied with anything less than a king; just as the Egyptians, in remote antiquity, ascribed the invention of their barley-drink to their benevolent god Osiris, while the ancient Germans conceived of a brew-house in Walhalla, under the supervision of a presiding deity. As a bit of amusing anachronism, it may be mentioned that there is a poetical apotheosis of Gambrinus, which elevates that personage to the dignity of a heathen god, alongside of Bacchus.

This slight digression from our subject, although showing how much mystery has at all times clouded the origin and the originator of beer, may not be regarded by our readers as a sufficient excuse for our inability to supply the needed information; but, much as we may regret this, we cannot help it. According to the testimony of the late Mr. Frederick Lauer, who himself brewed lager-beer in 1844, the honor of having first brewed the famous drink of to-day, belongs to one Wagner, of whom it is said, that, shortly after his arrival in America, in 1842, he set up a lager-beer brewery in a small building situated in the suburbs of Philadelphia. Lauer enjoyed the reputation of a walking encyclopedia of American brewing; as a matter of fact, he took a prominent part in organizing the National Brewers' Association and bringing about concerted action by the brewers in all matters relating to their trade, and kept himself well posted in all that concerned his colleagues. In 1885, a few years after his demise, the United States Brewers' Association erected a monument to his memory in a public square of Reading, Pa., the city in which he had spent the greater part of his life. If lager-beer had been introduced before the date here given, Lauer certainly would have known it.

We may take it for granted, then, on Lauer's authority, that lager-beer was introduced in 1842. Within six years

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from that date, German immigration began to assume unprecedented proportions; the hospitable shores of our country became the refuge of a great number of highly educated men, of skilled artisans and comparatively well-to-do tradesmen. The total foreign population increased from 1850 to 1860 at the rate of ninety per cent., and we may infer from the following figures to what extent this great influx of beer-drinkers accelerated the growth of brewing, and helped to increase the production of hops and barley:

Population	Production of Hops Pounds	Production of Barley Bushels	Number of Brewers	Value of Malt Liquors
1850—23,191,876	3,497,029	5,167,015	431	\$5,728,568
1860—31,443,321	10,991,996	15,825,890	1,269	21,310,933

Brewing had its earliest Western outposts on the Ohio and Mississippi and along the shores of Lakes Erie and Michigan. Pittsburgh, Cincinnati, Buffalo, Cleveland, Detroit, St. Louis, Chicago, Milwaukee—this is probably the order in which brewing spread out westward, closely following the German immigrants from about the middle of the thirties. In the fifties Pittsburgh, St. Louis and Cincinnati had already begun their shipping trade, extending their operations as far South as New Orleans. Even thus early that polyglot city had a few local breweries which supplied their customers with a kind of small beer, a beverage that had to be consumed immediately, lest it spoil between delivery and dinner-time. It is not to be wondered at then, that the New Orleans Germans hailed with delight the first consignments of lager beer that reached them in the year 1851 from Pittsburgh and St. Louis. The late J. Hanno Deiler, for many years professor of the Tulane University and a local historian of enviable reputation, refers to this in his "History of the German Press of New Orleans" in these words:

"As this consignment proved to be the first movement towards a great transformation, leading to a change

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in the habits of the population, inasmuch as it affected extensive commercial interests, abolishing numerous small businesses, and in their place calling into existence great industrial undertakings, employing millions of dollars as capital, the circumstance of its introduction, unimportant in itself as it may appear, assumes the significance of an epoch in the history of culture that brings the past into direct relation with present conditions, and is consequently entitled to more exhaustive consideration."

It was at about this time that the old praise of beer was again sounded with great vigor by many reformers. The third American temperance movement (the first being that of the early Colonials and the second the great agitation inaugurated by Rush) had again brought out the old arguments in favor of fermented drinks. Those who signed the pledge between 1810 and 1840 vowed to drink beer and cider only,—and even prohibition, which up to 1855 had been rashly adopted in seventeen States, but as quickly revoked or annulled in all but four of them—stopped short of cider and domestic wine and in many instances of beer. Now that the sobriety of the great mass of German beer-drinkers again challenged such comparisons as we have before quoted from Rush's and Coxe's writings, brewing again found many able advocates in the ranks of the foremost reformers.

Great as must have been the moral effect of these temperance preachments, they could not, nor did they, affect the consumption of beer which was then and really remained confined to the Germans until after the enactment of the revenue law. Even so, however, the territorial expansion of brewing within the decade preceding the Civil War was truly wonderful. In 1863 there were 2,004 breweries in operation, distributed over 31 States and Territories, and producing over two million barrels of beer; a great part of which quantity was retailed by the brewers themselves.

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Then, as now, New York stood at the head of the list in point of production, followed, in the order given, by Pennsylvania, Ohio, New Jersey, Illinois, Missouri, Massachusetts, California, Maryland, Wisconsin, Indiana, Kentucky, Michigan, New Hampshire, Iowa, Connecticut, Virginia, Minnesota, Rhode Island, Kansas, District of Columbia, etc. Brewing was then still carried on in Maine and Vermont, and breweries existed even in Utah and New Mexico.

During the next twenty-five years brewing developed without the least hindrance and attained to an economic importance second to but few American industries. True, prohibition loomed up again and had to be met at the polls; but although it gained a firm footing in two States, it was defeated in fourteen others. It killed brewing in these States, but its immediate results only helped to accelerate the growth of brewing throughout the country. In many States beer had by this time become the common drink of the people and even in the Southern States the people welcomed the establishment of local breweries, rendered possible by artificial refrigeration and the great improvements in the process of manufacture.

Just about this time, however, the prohibitionists seemed to have realized that in so far as the consumption of beer was recommended by the best minds as a measure of temperance, calculated to decrease the use of spirits, in just so far did it help to counteract their movement. From this time onward their whole agitation actually became a fight against beer. But a majority of the newspapers and of rational reformers still continued to advocate the use of the fermented drinks.

GROWTH OF TRUE TEMPERANCE

In 1881, Dr. Thos. Dunn English, the famous literary man, scientist and physician, published a remarkable pamphlet in which he advocated and justified the moderate use of beer. The eminence of Dr. English as a writer and his

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unchallenged integrity as a public man, procured the widest hearing for his views. The book was universally discussed and, of course, called forth a storm of adverse criticism. But it made a deep impression and in the light of the progress since achieved along the line of true temperance, this modest little treatise by Dr. English has prophetic as well as historical value. The following paragraph has never been surpassed for terse wisdom and philosophic truth, in all the literature of the subject:

“The assumption by extremists that beer represses the finer emotions, retards intellectual activity, destroys the physical power of the race, leads to crime and pauperism, and does many other terrible things, is simply absurd. Nothing can be farther from the truth. Certainly the Germans compare favorably on these points with the Mussulmans, who are claimed as water-drinkers. The latter have sadly degenerated since the days when their victorious hordes overran Europe, and threatened to place the crescent in triumph over the cross. I am aware that the followers of Mohammed are not the abstinents they are supposed to be. The Turks not only indulge in opium and tobacco, but in brandy—brandy is not wine—the Eastern tribes in lagmi, and the strictest believers in various alcoholic stimulants not coming from the grape, and so outside of the letter of the prophet’s prohibition. But the Mussulmans do not drink beer, and the Germans certainly do. The Anglo-Saxon race rose to greatness under the consumption of vast amounts of ale, and with indulgence in that stimulant kept up the steady vigor and intellectual power of a race that has imposed its ideas and language over a larger share of earth than any other people. In this country, where the consumption of malt liquors has risen in seventeen years from less than a million and three-quarter barrels to over thirteen and three-quarter millions, have we degenerated as a people? Last year over fourteen millions. Have we not manifestly gained

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by the partial substitution of a beverage containing a small portion of alcohol and a larger portion of nutritive matter for one containing fourteen times as much stimulation and no nutritive element at all? If you could create man over again, and make him other than his Maker has made him, you might constitute him without a craving for stimulants or for heat-food in its most concentrated form. As it is, the best you can do is to lead his instinct and direct his habits into the safest channel for both, and keep him in that as in all other things, within the bounds of moderation."

Time has but strengthened the force of Dr. English's argument, while the production of beer has risen to over fifty-eight million barrels and the consumption of whiskey has markedly decreased. This extraordinary increase of production has been accompanied by a pronounced gain in temperance and general well-being on the part of the working classes, the chief consumers of beer.

Dr. English's conclusions as to the comparative virtue of malt liquors, so furiously disputed on the publication of his little book, would challenge very little controversy to-day. We have been making progress in the interval, as witness these figures of beer production in the United States:

Barrels	Barrels
1880.....13,347,111	1894.....33,362,373
1881.....14,311,028	1895.....33,589,784
1882.....16,952,085	1896.....35,859,250
1883.....17,757,892	1897.....34,462,822
1884.....18,998,619	1898.....37,529,339
1885.....19,185,953	1899.....36,581,114
1886.....20,710,933	1900.....39,330,849
1887.....23,121,526	1901.....40,517,078
1888.....24,683,119	1902.....44,478,832
1889.....25,119,853	1903.....46,650,730
1890.....27,561,944	1904.....48,265,168
1891.....30,021,079	1905.....49,522,029
1892.....31,855,626	1906.....54,651,636
1893.....34,591,179	1907.....58,622,002
	1908.....58,814,033

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A REVOLUTION IN DRINKING HABITS

The lesson conveyed by these figures is irresistible and as such is accepted by all impartial students of the drink question. Prof. Henry W. Farnam says, in his preface to "Economic Aspects of the Liquor Problem," published under the auspices of the Committee of Fifty:

"Since 1840 there has been a steady substitution of malt liquors for distilled liquors in the consumption of the people. While there has been an increase in the total quantity consumed, the substitution of light drinks for strong drinks has brought about a diminution in the amount of alcohol consumed per capita. Moreover, though the *per capita* consumption of malt liquors has been nearly stationary since 1890, the consumption of distilled liquors has fallen by nearly one-third in that time. How far modern methods of production have influenced this change, how far it is due to German immigration or other causes, cannot be stated with certainty. The fact remains that our progress has been in the direction of moderation."

Although the statement that the per capita consumption of beer has been nearly stationary since 1890 is no longer correct, we have nevertheless quoted these words because they reflect the views of unbiased students as to the rôle of beer.

A comparison between the consumption of beer and spirits shows at a glance that, as a nation, we have progressed in the direction of true temperance at a rate and to an extent unequaled in history. Instead of being at the head of the list of hard-drinking nations—as we undoubtedly were fifty years ago—we now rank foremost among temperate peoples. By a singular coincidence, our Department of Commerce and Labor lately published comparative liquor statistics almost simultaneously with several official and private publications of foreign origin, dealing with the same question. In all these documents one important fact stands out in bold relief, and that is,

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as the Department of Commerce and Labor expresses it, that "this country is well-nigh at the end of the list of spirit-drinking countries." We may be permitted to quote the official table:

Countries	Spirits Gallons	Beer Gallons	Wine Gallons
United Kingdom	1.38	35.42	0.39
France	2.51	7.48	34.73
Germany	2.11	30.77	1.93
Italy	.34	.20	31.86
Russia	1.29	1.13	
Belgium	1.42	56.59	1.28
Sweden	2.13	8.83	.18
United States (1903)	1.33	18.04	.48

Leaving out Italy, our country should really stand at the very foot of the list, for the Russian figures, notoriously incorrect, are not ordinarily accepted at their face value. In fact, this is the only official publication in which they appear without some explanatory note casting doubt upon their correctness. The true significance of this official table, so far as our country is concerned, will only be fully appreciated, if it be borne in mind that the *per capita* consumption of beer in Bavaria, where distilled liquors are rarely used, amounts to about fifty-nine gallons and that alcoholism is practically unknown in that kingdom.

Commenting on the marvelously increased consumption of beer in this country and the coincident falling off in the quantity of spirituous liquors consumed, the New York "Sun" in a striking editorial (August 22, 1905) reaches the conclusion that "BEER DRIVES OUT HARD DRINK." The "Sun" also notes the fact that public drunkenness is comparatively rare in all the cities of America to-day, among all classes of society.

Mr. James Dalrymple, Glasgow's commissioner of municipal railways who was recently in this country, was constantly struck by the same fact as contrasted with conditions abroad. Drunken workmen are rarely seen in any American community.

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Yet the time is not so far back when a different state of affairs prevailed in this country. Hardly a generation since, whiskey was the common drink and drunkenness the national vice. The change has come through the substitution of malt liquors for ardent stimulants. As the "Sun" says, beer drives out hard drink. Moderation and temperance are supplanting excess in the use of liquors. The American people owe their sobriety to the brewing industry.

THE
PERFECTED
PRODUCT

Up to 1845 brewing was confined exclusively to ale and porter, and the manipulations of the brewer were of the simplest and most primitive kind, as compared with present-day methods. What would be regarded as a very small establishment now was then looked upon as a large brewery. Concurrently with the growing popularity of lager-beer came the almost countless mechanical improvements in both brewing and malting; the utilization of the scientific researches of a host of such eminent men as Pasteur, Hansen, Delbrueck, Van Laer, Morris, Joergensen and many others; the practical application of the many thorough investigations into, and the works on, fermentation, yeast-culture, bacteriology, etc., and finally, the employment of artificial refrigeration; and it may be said that brewing entered upon a new era. These improvements did not, of course, reach the climax of their perfection at once; decades elapsed before the new methods became an indispensable requirement of success, and only in recent years have they overcome the conservatism of ale brewers, with the happy result of adding to the desirable qualities of ale some of the best characteristics of lager-beer; among others, a low alcohol-percentage, effervescence without deposit and brightness under low temperature. Since then the American brew-house has become a model of perfection not equaled in Bavaria, the "land of beer," as has readily been admitted by distinguished foreign

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authorities, such as, for example, Professors Delbrueck and Van Laer, who not long ago visited a number of eastern and western breweries. In this respect the brewers of America stand in the front rank of the most progressive manufacturers, their establishments being equipped with the modern and costly appliances which have taxed and rewarded human ingenuity in this particular field for years past.

In the table of production last quoted the reader will notice remarkable increases in the years 1906 and 1907, amounting, respectively, to 5,129,607 and 3,970,362 barrels, and a very insignificant increase of 192,031 in 1908. In the succeeding fiscal ending June 30th, 1909, there was a decrease exceeding in the number of barrels the average increase of the two first-named years. The greater part of this loss is doubtless due to the panic, but it is quite certain that a considerable proportion of the decrease was caused directly by prohibition in one form or another. It is difficult to localize these losses with mathematical accuracy, but there can be no doubt that brewing has suffered in all parts of the country where the Anti-Saloon movement has succeeded. From present indications it is safe to infer that in the South the industry will in the end suffer more than anywhere else; it is equally certain, however, that, unless the adverse movement should develop greater strength than appears probable at the present time, brewing throughout the country will rapidly recover from its recent set-back and resume its former rate of development, acquiring new markets and new customers as has been the case during the fifty years.

CHAPTER VIII.

HOW BEER IS BREWED

WE now proceed to give a description of the various processes of brewing, which we trust will not be deemed too elaborate, in view of the special character of this work; and to this end we shall beg leave to conduct the reader through the several departments of one of the largest breweries of our country.

It is to John Barleycorn, immortalized by Robert Burns and innumerable other poets of less renown, that we must first turn our attention; but we need not follow his career from the beginning, as poetically described by the Scotch bard, for he makes his entry into the brewery after he has already undergone a great part of his sufferings.

“They laid him out upon the floor,
To work him further woe,
And still, as signs of life appeared,
They tossed him to and fro.
They wasted o’er a scorching flame
The marrow of his bones.” * * *

The entire poem is undoubtedly familiar to every lover of drinking-songs. In it the poet describes all the manipulations incidental to the cultivation of barley, from the planting of the grain to the reaping of it; and also all the numerous and manifold operations to which the ripe cereal is subjected after it has left the farm and passed into the hands of the maltster.

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The concluding process of malting, described in the quoted lines, has done its work, when John Barleycorn turns up in this brewery to begin a new series of ups and downs, calculated and designed to still further purify him and render him fit for the climax of his fate. Malt, as every one knows, is obtained by a four-fold treatment of the barley. The grain must be steeped in order to cause germination and produce diastase, the agent necessary for the conversion of starch into that saccharine matter which forms the primary essence of beer; it must be next couched and floored, when it continues to grow and germinate; and, lastly, it must be subjected to kiln-drying by which germination is terminated. When this malt, loaded upon ponderous wagons, reaches the brewery, it is at once conveyed, by means of most ingenious contrivances, into malt-scales and weighed. On its way to the enormous bins, four in number, which serve as storehouses, it is subjected to repeated processes of sifting, screening and blowing—the latter part being effected by means of air passing through flues or pipes, connected at certain intervals with the shutes through which the malt passes. The storage-bins occupy nearly the whole of one wing of the main building. They form one vast shaft, divided into four chambers, running through several stories up to the top-floor, and leaving on each floor just room enough for a narrow gallery or corridor. The malt is raised to the tower and thence distributed into these bins, which together hold about fifty-six thousand bushels of barley, and are so constructed as to facilitate the utmost cleanliness in every nook and corner of them.

The first operation of the brewer, when beginning to brew, is to grind the malt. John Barleycorn's sufferings here begin where Burns makes them end:

“But a miller us'd him worst of all,
For he crushed him between two stones.”

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CRUSHING THE MALT

The same powerful machinery which raises the malt into the store-houses, is now again set in motion to convey the quantity of malt requisite for each brew, from the store-rooms through a series of shutes, shakers, and magnet-studded slides, to and from the scales into the malt mill. On its devious course to this point the malt is shaken upon sieves, rocked to and fro, and constantly accompanied by currents of air, all of which is intended to separate all germs and dust from the malt, and to leave the latter as free as possible from useless and harmful matter. Shutes covered with powerful magnets, serve to attract and hold nails, bits of iron or other similar metallic substances, which may be in the malt. After being weighed—an operation which one man can perform by simply depressing any one of four levers attached to the scales and communicating with the store-bins—the malt is ground, or rather crushed between metal rollers. In its crushed state, it is again conveyed, in the same mechanical fashion to the top-floor, where it is deposited in smaller bins, three in number, each holding 500 bushels. The malt-scales, two in number, one to weigh the malt when it is received, and the other to weigh the quantity needed for each brew, are placed immediately below the store-bins. The double weighing operation enables the brewer not only to calculate, at any time, the quantity of malt consumed and still on hand, but also to determine, with accuracy and without much labor, the exact quantities which he requires from day to day. The latter is very important, because everything depends upon a proper proportion of ingredients.

Simple as all these operations may appear from our description, they are, nevertheless, effected by most complicated and costly machinery, in the construction of which human ingenuity was put to a severe test. The principal object of these machines is not, as might be supposed, the saving of labor, but rather the elimination of

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chance and accident from this preliminary work of the brewer. These most modern improvements preclude almost entirely the many chances of failure to which a less perfect method of sifting malt will always expose the operation of brewing. The presence of any metallic substance or of an excess of germ or dust, will inevitably spoil the wort. The methods spoken of here not only preclude this, but also tend to insure uniformity of quality, and offer, besides, a certain degree of immunity from the danger of explosion, which is ever present in any establishment where the elimination and collection of the malt-dust is effected in a less perfect way. As we have seen, the floors of the west wing of the main building serve the purposes of weighing, sifting and storing malt. On the upper floors of the other parts of this building we find, in separate rooms, the smaller bins before described; tuns for preliminary mashing; the cooling tank, and a number of colossal vats containing water of varying degrees of temperature, heated by exhaust steam.

MASHING AND SPARGING

Having crushed his malt, the brewer now proceeds to mashing, a most important part of his art. The crushed malt is conveyed from the smaller bins to a "Vormaischbütte," that is to say, a mash-tun in which the malt is thoroughly mixed with water, preparatory to its transfer to the regular mash-tuns. Neither manual labor nor physical efforts of any kind are required in thus conveying the malt to the mash-tuns; everything moves by steam-power. The object of mashing, *i. e.*, the process of infusion or mixing the malt with water at a proper temperature, is two-fold, *viz.* 1, to extract from the malt the saccharine substance and dextrine which are contained therein; and secondly, to convert into maltose and dextrine the residue of unconverted starch. The three immense iron tubs, in which the malt is mashed, are set in wooden frames, rising about four to five feet above the flooring. Here, too, the magnificent

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plant of steam engines, of which we shall speak later on, is brought into application; it sets in motion the mashing apparatus within the tun, which is composed of a number of raking contrivances fastened upon two huge arms, revolving in opposite directions around central pivots, in such manner as to mix every particle of the grain, as it drops from the "Vormaischbütte" on the floor above.

Now is the time to realize the importance of the perfect cleaning and grinding of the malt, for the result of mashing depends in part upon these two preliminary processes. If the malt be insufficiently crushed, much of the extract will be lost, or rather, to be more precise, much of the starch will resist infusion and thus remain bound up in the grain, which latter then passes out of the tun with a considerable portion of its starch adhering to it. If, on the other hand, the malt be crushed too fine, or if it be insufficiently cleaned, retaining large proportions of dust, a part of the wort will become pasty and absorb much of the "goodness," thus impairing the quality of the beer.

Before the invention of the modern appliances before referred to, the very best raw material frequently failed to yield the results which the brewer was justified in expecting from it, and such failures, the true causes of which were rarely understood, gave rise to trade-superstitions which the modern brewer laughs at, conscious of his superior knowledge.

While the process of mashing is going on, the brew-master must be constantly on the alert; he must watch the temperature of the water, with which he mixes his malt; gauge the effect of the heat upon the quantity and quality of his mash; and determine, at a glance, almost, when to open the valves of the mash-tun, in order to draw off the wort into the copper or boiling kettle below. As in everything connected with brewing, science furnishes him a reliable guide in the shape of a saccharometer, which indicates the proportion of sugar in the wort, and other

instruments with which to test temperature, etc. When the opportune moment has arrived for drawing off the sugar-laden liquid, the brewer opens valves or doors in the bottom of the mash-tuns, through which the wort runs into pipes, and through a filtering apparatus into the boilers on the floor below. While this is going on, and before half of the wort is run off, we witness another operation called sparging, by which the useful substance still remaining in the malt is washed out. By the sparging machine a continuous shower of hot water is evenly thrown on every part of the grain; it issues from hollow arms, perforated on their reverse sides, and horizontally fixed to an upright pin. As soon as the water begins to force its way out of the holes, in opposite directions, these arms revolve automatically; the raking appliances, meanwhile, continue to whirl around, constantly stirring up the mash, thus enhancing the effect of the water and accelerating the operation. Insufficient or ineffective sparging means a considerable loss to the brewer.

When sparging is completed, the brewmaster changes the scene of his activity; he descends to the floor immediately below the one where his mash-tuns are placed. These two floors are closely connected with each other; in fact, through large openings in the ceiling, which openings are surrounded by substantial guard rails, we gain an almost unobstructed view of both rooms at one and the same time; and even if we knew nothing at all of brewing, the sight of so many pipes, tubes, funnels and shafts connecting the upper floor with the lower, would convince us that the closest relation exists between the two rooms. On this lower floor our attention is at once attracted by three huge copper kettles, every part of which, as well as the many pipes which we see here, at once impresses us with the truth of the saying, that when a brewer is doing nothing, he cleans and polishes his utensils. Indeed, the pride which every journeyman brewer takes

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in the cleanliness of the establishment is made manifest at every step we take; but here, in the kettle-room, where every object far and near is faithfully reflected, as if in a mirror, upon the resplendent sides of the brew-kettles, an extra effort seems to have been made to outshine every other department.

The liquid which now runs from the mash-tun into the boiling-copper contains all the ingredients which constitute what we may call the body of the beer; it is the extract of a highly nutritious grain, gained in such a way as to justify the designation of liquid bread, which an eminent chemist has assigned to malt liquors. But all the nourishing qualities of the grain have not been extracted; a very large proportion, comparatively speaking, remain in that part of it for which the brewer has no further use. In the brewery under description these grains are conveyed through large pipes from the mash-tuns to the ground floor, or, rather, to an arch-way where wagons may be brought to receive them. They are used as food for cattle and have proved to be the best nutriment for milch-cows. According to the exhaustive analysis made by the Agricultural Experiment Station of this State, and many other investigations, brewers' grains, even when no longer perfectly fresh, are usually nourishing and, when fed to milch-cows, tend to increase the quantity and enhance the quality of the milk. It is estimated that no less than two-thirds of the bulk of brewers' grains, as they issue from the mash-tun, consist of water, and this moisture not only militates against the transportation of the grain to rural points, but also accelerates decomposition—two reasons which have prevented a more general utilization of the grains by dairymen. A number of grains-drying machines have been invented, and we learn of others in course of construction, by which the grains may be profitably dried and preserved.

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BOILING THE WORT

The boiling of the wort in these three huge coppers is another one of the essential phases of brewing. The heat required for the boiling is furnished by boilers which send a continuous current of steam through the coils fixed in the copper. These coppers have covers with small sliding doors, which, during the process of boiling, are rarely opened except to enable the brew-master to make his tests. Were it not for these covers, the boiler-room would be enveloped in an impenetrable cloud of steam, which would greatly hamper all manipulations. As it is, the steam finds an outlet through a large pipe or flue fixed on top of the copper. It is at this stage that the hop is added to the wort, but not until after the latter has boiled a sufficient time. Usually, the boiling requires four hours; at the expiration of the third hour, or still later, perhaps, the brewer will empty the contents of several large sacks full of aromatic hops into the copper, thus adding the bitter principle to the saccharine. The proper treatment of the hops at and during this stage always has been a matter concerning which few brewers shared the same opinion; but of late scientific investigations have removed many prejudices which arose from a misconception of the nature, ingredients and functions of the plant. At present, the average brewer fully understands that he can extract the essence of the hops without excessive boiling. The object of the boiling is: 1. To concentrate the wort; 2. To extract the essence of the hop; 3. To coagulate the unchanged albuminous substances and cause them to settle, together with the unconverted starch which, if allowed to remain intact, would materially militate against the preservation of the beer. But this does not do justice to the important function of hops; at least it is to be feared that, to the average reader, it will not convey a clear idea of the action of this tender plant upon the wort. Without it, beer

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would be nothing more than fermented barley-juice, which, as we have seen, was known to the most ancient nations. Without it, beer could not be preserved for any length of time, and both in appearance and flavor would be greatly inferior to the drink of to-day. Hence, hops not only impart to beers their pleasantly bitter and aromatic flavor, but they also assist in clarification and produce the preservative qualities of the liquid. The two principal substances which the hop-cone yields when boiled, are lupulin and tannin, and it must be the brewer's aim to extract these in just that proportion which the condition and quality of his wort require. Injudicious handling of the hops may result in an excess of tannin and a deficiency of lupulin, and may otherwise work injury to the finished product. The diminutive sparkling grains of the hop-flower, called lupulin, are closely wrapped up in the center of the hop-cone, and should be laid bare before the plant is placed in the copper. To this end most brewers break up the hops, and the writer was shown a most ingenious and yet exceedingly simple machine which performs this operation in a highly satisfactory manner.

Hops, as delivered at the brewery, are packed in large bales, each weighing 180 pounds; the quantities required for immediate use are taken out of these bales, broken on the machine above referred to, and then placed loosely in large canvass bags, provided with hoop-like handles. As a matter of course, these quantities are all carefully weighed before being dumped into the copper. Scientific observation and practical experience have taught the brewer not to boil the hop too long. Formerly the plant was boiled "all to pieces," the object being to expedite the precipitation of the albuminous wort by means of the extracted tannin. At present, the boiling time is reduced to a minimum, and yet, by reason of the opening of the hop-cone, the effects and essential functions of the hop are not in any manner impaired.

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In the purchase of hops, the brewer must use good judgment and great care so as to secure an article rich in lupulin, fully mature, not too old, cleanly picked and properly dried. If he obtains such hops, he may still have room for complaint on account of the lack of that flavor which is the result of long-continued cultivation and the natural advantages of a favorable soil. The latter causes have made Bohemian hops famous all over the world. Any brewer who strives to produce the very highest grade of beer will always use a certain proportion of these extra-aromatic hops in conjunction with the domestic product. For all practical purposes, however, American hops are as good as, if not better than, the average foreign article, with the exception of a few varieties, the production of which is also confined to a rather narrow territory.

COOLING THE BREW

When the boiling is completed, the brewer again descends to a still lower floor, where we see, besides many engines, pumps and other gear, a large black rectangular tank which is placed directly under, and connected with the boiling-coppers. This is technically called a hop-retainer or hop-back; the former term undoubtedly more intelligible than the latter, and certainly more appropriate because the function of this tank is to check or retain the hops, while the hopped wort, flowing through open valves in the bottom of the coppers, is being rapidly pumped back to the top floor, where an expansive iron receptacle called the cooling-tank, stands ready to receive it. Poor John Barleycorn! In different conditions he has now made this same trip up and down for the fourth time, and yet the end of his journey is still far off. The contrivance which effects the retention of the hops consists of a perforated false bottom within the hop-back, or, in other words, of a sieve equally as large as the iron tank into which it is fitted, and so fixed as to leave between it and

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the real bottom of the vessel a sufficient space for the reception of the wort. At this stage, the head-brewer thinks of but two things, namely, to send his wort to the cooling-tank as rapidly as possible and to have it reach its destination clear and brilliant. For the latter purpose he allows the wort to settle in the hop-back for about twenty minutes; this done, he adjusts the pumps, sets them in motion, and then ascends to the top floor to watch the steaming liquid, as it issues from the pipe and, with a sound between a hiss and a roar, rushes into the tank. If we wish to form an idea of the shape and dimensions of this cooling-tank, we must do it now, for in a few moments, as the hot liquid accumulates, a dense cloud of steam, fraught with the enlivening aroma of the hops, begins to fill the immense room, rendering everything indistinct, except when a particularly strong gust of wind rushes through the wide openings in the lattice-work of the windows and for a moment lifts the vaporous veil. The shape of this vessel is that of a gigantic rectangular pan; its depth is three feet; its lateral dimensions are 30 x 42 feet; its capacity equals that of two of the three boiling-coppers, each one of which holds three hundred and seventy-five barrels.

Although he has the most perfect refrigerating apparatus at his command, our brew-master now evinces considerable anxiety; he is pretty sure of the usual result of his operations; but he knows "there's many a slip between the cup and the lip," or, rather, between the cooling-tank and the fermenting tun; and right here appears to be the only loophole which human ingenuity left to chance. His object is to reduce the temperature of the liquid and render the wort properly amenable, in the desired measure, to the action of the yeast which he will presently add to it, and thus place it in a fair way for the beginning of fermentation. But unless this is done rapidly, the wort may turn sour, and besides, many believe that other dangers usually

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accompany a protracted exposure of the liquid to the open air. In many breweries, particularly those situated on depressed ground, or hedged in by other high buildings, artificial means are employed to accelerate this first stage of the cooling process.

Cooling is one of the most interesting, as it is one of the most important, phases of brewing. The manner in which it is accomplished in model breweries of to-day, impresses us with the greatness of science and its illimitable resources when pressed into service of a progressive industry. Formerly, the successful brewer of lager-beer depended very much upon the climate, the supply of ice and the chances of securing what the Germans style "Felsenkeller," rock cellars; that is, deep caverns hewn into the rocks. The refrigerators of to-day completely emancipate the brewer from the thralldom of these contingencies; he can now brew almost anywhere and everywhere, even in Southern climates. Mild winters and consequent scarcity of ice have no terrors for him; and if it were not for his second nature to utilize every natural advantage offered him, he might get along without any cellars, certainly without "Felsenkeller." From the cooling-tank the wort is conveyed through pipes into a pan, whence it trickles over two refrigerators. These two refrigerators are on separate floors, one above the other; the one over which the wort passes first is supplied with water from an artesian well; the other derives its cooling capacity from a refrigerating plant, of which we shall presently speak at some length. Having now reached the temperature most suitable for the beginning of fermentation, the wort passes directly into the fermenting tuns.

Fermentation, artificially induced by the
FERMENTATION admixture of yeast, at the rate of about
one pound per barrel, sets in at once and
gradually converts the saccharine principle into alcohol
and carbonic acid gas, thus imparting to beer that quality

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which places malt liquors in the category of intoxicating beverages.

While fermentation continues, the same vigilance which prevails in every part of the brewery, must be constantly exercised. The conversion of sugar into alcohol and carbonic acid gas should be gradual, not sudden; hence, when the fermenting process becomes too rapid, either by reason of defective yeast or on account of the unsuitable temperature, it must be restrained by means of attemperators, that is, coils which are placed in the fermenting-tun and connected with the refrigerating plant.

As in all other operations thus far described, so here, too, the prolific genius of our age of inventions has placed at the command of the brewer machineries with which he can regulate the temperature of these oceans of turbulent, foaming liquids, either by a light pressure of his hand, by the turning of a small wheel, by pressing upon a knob, or by such other equally simple manipulation. In this fermenting room, as well as in the cellars, into which we shall pass presently, everything assumes Titanic proportions, and the human beings who move about these places appear like pigmies. When we see fermenting-tuns holding from three hundred to four hundred barrels, and settling tuns of the size of an ordinary house, extending through two stories, and holding seven hundred barrels or twenty-one thousand seven hundred gallons of beer; and when we consider that these monster casks, filled with John Barleycorn's blood, cover miles upon miles of cellar-room, we begin to realize and appreciate the power of the engines which are at work in this brewery.

As fermentation progresses, workmen are constantly in attendance to watch the process. On ladders, almost three times the size of their own bodies, they climb to the top of the tuns to skim the beer with huge ladles, testing at the same time, by taste and touch, the condition of the

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liquid mass, in order to determine when to draw it off to the resting-tuns.

The transfer of the beer from the fermentation vats to the resting-tuns and from these to the storage casks is accomplished by hydraulic and air pressure, and in such a way as to require no other labor but that of opening or closing valves or depressing levers. As we descend into the cellars, three stories under the ground, the temperature becomes more and more stinging, the walls and ceiling are covered with ice to the depth of from three to five inches, and every vat and cask is thickly encrusted with frost. In forming an idea of the capacity of these cellars, we cannot simply depend upon the number of square feet of ground occupied by them, because both vats and casks rise to a height almost equal to that of the cellars, and they vary in capacity from fifty to five hundred barrels. The beer contained in them would float a fleet, since their aggregate minimum capacity amounts to 125,000 barrels.

 The last operations to which the beer is
FINAL
OPERATIONS subjected are those of cleansing, fining
and krausening. The beer passes from
the settling vats to the storage casks, in which it remains
from three to four months, when, after another winding
journey through miles of pipes, it emerges bright and
clear and brilliant, only to be racked, that is to say, filled
into kegs which go to the retailers.

The same continuity of operations which we have witnessed on the floors above ground, is also observed in the three tiers of cellars, and the relation between the latter is almost as close as that between the former. We have already indicated the character of the connection which exists between the different kinds of tuns, vats and casks into which the beer is filled at different stages after the brew is completed. We have seen that fermentation takes place in open vats, and is regulated by attemperators, fed by the refrigerating plant and by means of powerful

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pumps. Formerly, another means of restraining fermentation, which was applied manually, was resorted to; it consisted of conical cans, called swimmers, which the brewer filled with ice and placed in the fermenting liquid, where they floated about and depressed the temperature.

When the desired results of fermentation are secured, then, and not until then, is the wort transformed into beer but before it becomes fit for consumption, it must rest for a considerable length of time, to be then transferred to the storage casks, where the processes of fining and krausen-
ing take place. For the former process, chips or shavings are used, usually those gained from the beech-tree, by which the muddy particles, resulting from fermentation and still remaining in the beer, are attracted and held, leaving the bulk of the liquid clear and translucent. While this is going on, large quantities of carbonic-acid gas continually escape from the lager-casks, and, ultimately, in order to re-enliven the liquid, a second fermentation must be produced by adding one-fifth of a new beer to four-fifths of the old. This is done by means of pipes which convey the new beer through two tiers of cellars to the lager-casks.

Mashed, sparged, boiled, cooled, doubly fermented, clarified and thoroughly aged, the beer is now ready for racking. This is done by several gangs of men at the same time. The quantity to be racked and the capacity of the packages to be filled being known, the foreman is enabled to determine how many kegs must be held in readiness. Each "racker" has a given number of kegs before him. Above a wide board, which runs along the wall, there is a long row of faucets through which the beer, drawn from the lager-casks, flows into a detachable hose and thence into the kegs. When one keg is full, the hose is quickly inserted into another, and, while this is being filled up, the first is being closed up with a wooden bung tightly hammered into the bung-hole. In the lower end of the

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pipes, to ^{the} which the faucets are attached, glass tubes are inserted, ^{which} enable the "racker" to discover immediately the slightest change in the color or clearness of the beer. When such a change occurs, the stream of beer must be turned off at once, because the presence of muddy particles indicates that the sediment in the lager-cask has been reached and is being stirred up.

The kegs are now ready for delivery to the retailer, and pass out of the proper domain of the brewer, until they are returned empty and are again conveyed to the wash-house, or, perhaps, if their condition should require it, to the pitching-yard or to the cooper-shop—all of which places we shall presently visit on our tour of inspection.

CHAPTER IX.

WATER, ICE, STEAM, AND LIGHT

HAVING witnessed the process of brewing, from the grinding of the malt to the racking of the beer, we now turn our attention to the extensive and complicated plant which furnishes this brewery with water, ice, steam and light. The first inquiry addressed to the brew-master concerning the water brings on a highly interesting lecture on the importance of this element in brewing, and the difficulty of obtaining it in the state best suited for our purpose. True, the water which gushes from the gneiss-rocks of Manhattan Island, as well as that which is conveyed to us from afar through the aqueduct, is very good and wholesome; but it will not bear a comparison with the water that the Munich brewer receives from the river Isar, nor that which, ever since the 13th century, has rendered famous the ales of Burton-on-Trent. The reputation of the Munich beer is quite as old as that of this English ale, and in both instances popular superstition attributed the excellent qualities of these beers to secret recipes, possessed only by the monks who operated the breweries. The real and only secret, however, was the exceptionally favorable quality of the water. Our water is not the worst by any means; quite the contrary, it is, as we have said, good and suitable enough for brewing; but not a single experienced brewer in our land would dare to deny that if we had Isar water, our beers would be better than those of Munich; in fact, even with this difference in the water operating against us, much American beer is pronounced by connoisseurs to be superior to the average Munich beer.

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In an establishment of the size of the brewery we are describing, water plays an important part, not only as a component of beer, but also as an essential agent of cleanliness, motive-power and temperature. For all these purposes the ordinary supply of water does not suffice. To cover the deficiency, this brewery has two sources from which copious supplies are drawn. The one is an artesian well, which yields, daily, 50,000 gallons of water; the other, a pumping station on the East River which, during the summer months, or whenever needed, supplies daily 900,000 gallons of salt water, used for the condensers of the refrigerating machine. The artesian well is seven hundred feet deep, drilled through solid rock, and constructed in the best manner; it is worked by a powerful duplex pump. The enormous quantities of water flowing into the brewery, and used for purposes other than brewing proper, supply eight steam boilers, furnishing steam for fourteen engines of twelve hundred horse-power; a refrigerating plant, consisting of three machines, of an aggregate ice-melting capacity of 330 tons; the different stables, and the wash-houses, where barrels, chips, wagons, etc., are cleaned.

In describing the different floors on which the processes of mashing, boiling and cooling are carried on, we noticed the presence of many large wooden vats full of water. The water in these vats, used principally for mashing and boiling, receives a preliminary heating by means of exhaust-steam, which proceeds from the brewery engines and would be wasted, unless utilized in the manner indicated. An apparatus, specially designed for this purpose, conducts the exhaust-steam into coils fixed in the vats; in this manner the temperature of the water is raised and less heat is required to bring it to the boiling-point. Ordinarily, these vats are entirely covered with thickly padded canvas, to the end that the heat may be more effectually retained. When we consider that the annual consumption

of fuel in this brewery amounts to six thousand tons of coal, we can readily understand that a waste of heat, in whatever form, must, in the long run, result in a very considerable pecuniary loss. In its downward course, from floor to floor, the water used for the purposes before mentioned, flows through pipes which empty into the tubs and boilers, and are supplied, at suitable points, with instruments for gauging quantities and determining temperature. By means of powerful steam-pumps, the water is pumped from the Croton main into the vats, where it is heated as described. The vats on the floor next to the ground-floor furnish warm water for cleaning the kegs. Thus, the water, too, passes through a series of connected pipes, vats, tubes and tuns, up and down the entire height of the building, serving a different purpose at every stage and forming another circle within a circle.

The refrigerating plant rests upon a REFRIGERATION massive foundation; it has three floors, including the ground floor, and covers twelve thousand five hundred square feet of the brewery premises. The system of cooling rests upon the principles first applied to this purpose, in 1849, by Gorrie, but has been improved upon during the successive stages of its development to an extent far exceeding the progress of any other scientific discovery. As applied in this brewery, the system performs its functions by means of the *direct* expansion of ammonia in iron pipes, placed under the ceilings and on the walls of the cellars; a far more effective and economical method than the system by which the brine, after being cooled in large tanks, is forced through the cooling pipes by means of steam pumps. The plant consists of four De La Vergne machines, each of an ice-melting capacity of 310 tons; these cool about forty cellars, or an aggregate space of 1,750,000 cubic feet, and furnish, in addition to this, all the ice-cold water required for the attemperators in the fermenting tuns, and for the

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coolers over which the wort passes when it leaves the cooling-tank, as explained. To describe the intricate process of cooling is a difficult task, save on the assumption that the reader fully understands the principles upon which the system is based. We must take it for granted that the reader knows that the rapid expansion of a compressed gas, as well as the volatilization of some liquids, is invariably followed by a lowering of the temperature, and that by a proper utilization of this change of temperature intense cold, to almost any degree below the freezing point, may be produced at will. The machines invented for this purpose vary considerably, both in effectiveness and cost, and in almost every country a different system is in vogue. The best American machines appear to be compounds of all the virtues and advantages of the most approved systems now in use; and it is claimed that the De La Vergne refrigerator yields to none in any respect. The principal parts of this apparatus are the boilers, expansion cocks, refrigerating coils, compressors, separating tank and ammonia condensers. The boilers are placed on the ground-floor, the machines on the next, and the condensers on the top-floor. Like every other material or agent we have thus far described, the ammonia, too, passes through a number of variously connected circuits, down into tiers upon tiers of cellars, and up again through the three floors above ground, only to recommence the same journey and repeat it again and again for the self-same purpose. The ammonia first goes in a liquid state into the cellar, where it is distributed by means of expansion cocks into the refrigerating coils; thence the three machines draw it up in a gaseous state and compress it. From the compressors, it passes into a separating tank, and here the oil is eliminated and sent to the oil-cooler, while the ammonia, still in a gaseous state, ascends to the ammonia condensers on the top-floor of the building. By the use of salt water on the outside of these condensers, the ammonia is re-

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liquified, and in this liquid state again descends to the cellars, as before described. Still another circle within a greater circle! A recapitulation of the functions of this refrigerating plant may not be out of place. It cools 1,750,000 cubic feet of space in cellars; supplies ice-cold water for the attemperators in fermenting tuns and reduces the temperature of the wort, as it passes over the cooling pipes, to 40° Fahrenheit. During the summer months the beer to be cooled, in the latter manner, amounts on an average to two thousand barrels, daily—the maximum daily brew being twenty-seven hundred barrels.*

THE STEAM PLANT

The steam required in this brewery for all the operations already described, and others still to be spoken of, is generated by eight colossal boilers, each five and a half feet in diameter, and containing fifty-six four-inch tubes. They are of the horizontal return tubular type, fitted with patent furnaces and water arches, and rated at 130 horsepower, each. This boiler plant is really of double the capacity needed, and, hence, only one-half of the number of boilers is alternately in use, the other half being provided as a reserve in case of emergencies. The steam generated in these boilers drives fourteen engines. Of these, one is used in the machine shop; three serve the purposes of the refrigerating plant; two are used for the electric-light plant; three, varying from 100 to 165 horse power, set in motion the mashing apparatus, the malt-mill, malt elevators, keg-washing machines, rotary pumps in cellar, two Otis belt elevators and four keg elevators. Two of the latter are used for lowering empty kegs into the cellar, and the other two for raising filled kegs. In addition to these, there are four more engines, one each for driving a feed-grinder and fodder-cutter in the stables, a set of revolving and suspended fans in the office, the cask-rollers in the pitch-yard and the machine for washing chips.

*Multiplied by four, these figures give *present* output.

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All these steam motors, as well as the refrigerating machines, are connected with that system of steam condensation to which we referred in describing the partial heating of brew-water by means of exhaust steam. Previous to condensation the exhaust-steam passes from the engine through an apparatus, called grease extractor, which eliminates the oil; it is then conveyed to a Gannon surface condenser and thence returned to the boilers. In this process of condensation a vacuum of from twenty-five to twenty-six inches is produced by means of an air-pump. The immense quantity of salt water used daily for the condensers of ammonia is so profitably utilized in this manner, that condensation is effected without an extra supply of water.

Cooperage is no longer a handicraft in America; the inventive genius of our people, to which we owe the greater part of the progress that has placed us at the head of civilized nations in point of machine-building, has virtually wiped out the cooper's handicraft, and given us, in its stead, a half-dozen enormous manufacturing establishments, in which nearly all the barrels required by brewers and distillers are made by machine. There was a time when nearly every brewer had at least a smattering of the cooper's art, and when the cellar men, employed in breweries, had to produce satisfactory evidence of having passed through the regular course of training prescribed for apprentices and journeymen by the ancient and honorable guild of coopers. Although this is now all changed, yet in so large an establishment as the one we are describing, the employment of a considerable force of coopers is indispensable. The large casks and vats, ranging in capacity from 50 to 800 barrels, which fill the cellars of the brewery, number about 1,500, and there are about 100,000 packages—*i. e.*, barrels of thirty-one gallons, and half, quarter and sixth barrels—in constant use; and a considerable reserve

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stored away for emergencies. The coopers keep an accurate account of these packages and vessels, examine them from time to time, and make such repairs as their condition may require.

The pitching of barrels, which serves the two-fold purpose of facilitating the process of cleaning and preventing the beer from acquiring a smell of the wood, is performed periodically, with such methodical regularity that not a single package can escape this fiery ordeal. The pitching yard, enclosed by a wall, is the scene of this part of the cooper's task; here, too, manual labor forms only an adjunct to steam power. Four large cask-rollers, and many smaller ones, all driven by a steam engine of ten-horse power, a pitch oven and a pitch cauldron take the place of the single implements with which, in former days, the cooper used to perform this work. After the liquid pitch has been poured into the casks, the latter are placed upon the moving rollers and continually rotated, by which process the pitch is evenly spread over the inner surface of the barrels and kegs.

The manufacture of brewers' pitch yields a considerable income to an important industry, and is of no small benefit to the producers of the raw material. A number of substitutes for pitch have been offered in the market, and some of them, especially one made of the residuary substances obtained in the process of refining petroleum, possess many qualities lacking in pitch; but here the conservative spirit of the brewers prevails against innovation, for none of the substances have that peculiar, although exceedingly faint, flavor for which the ordinary pitch is so highly prized by both the brewer and the drinker.

All kegs are washed as soon as they return from the retailer, and the importance which the brewer attaches to this part of his business may be inferred from the fact that no less than one hundred barrel-washing machines have been invented—a sure sign of pressing demand. The

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machines used for this purpose are of the very latest pattern, and perform the work of washing and scrubbing with a thoroughness that leaves nothing to be desired. The kegs are washed several times, and always with hot water, supplied, as we have already stated, from one of the vats on the floor above. They are washed both inside and outside. The operation is entirely automatic. Although the cleaning of the outside of the barrels is not essential, great care is, nevertheless, bestowed upon this work, which is performed by scrubbing-machines. The latter seem to give much satisfaction, and are, therefore, in general use in all large breweries.

It is one of the characteristics of the American brewers to disregard expense, when the quality of their product is at stake, and can be enhanced by the use of modern appliances; in that case they give no thought to anything else, but when no such considerations prevail, they show a remarkably conservative spirit, and prefer to adhere to old methods, particularly when the use of modern inventions would necessitate a reduction of the number of workmen. Cleanliness being a principal condition of the keeping quality of the beer, the brewer devotes to it all the modern appliances he can secure. The wash-room, situated on the ground floor of the main building, has a cemented floor and is bordered with open gutters, which empty into the sewers. The men employed in it wear heavy boots, impervious to water, but are otherwise clad in the usual dress of the "Brauburschen." In the matter of dress, by the way, the spirit of our age has wrought many innovations; excepting the blue blouse, every article of dress that used to distinguish the brewer's guild from other handicrafts, has disappeared.

Although but indirectly connected with the cooperage, the treatment of chips or shavings may as well be disposed of under this heading. As we have seen, beech shavings are used for the clarification of the beer while in storage

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casks, where a second fermentation takes place. Before being so used, the chips undergo a thorough process of boiling and washing, which is accomplished by steam-driven machines of very modern origin. Under favorable circumstances the chips serve this purpose more than once; but, when this is the case, they must again be subjected to boiling and cleaning. In this brewery, beech chips are used exclusively. The stock on hand at the time of our visit was in keeping with the enormous quantities of raw material which filled the store-rooms.

A GREAT INDUSTRY

In concluding this sketch of a modern brewery, a few words must be said concerning the position which the brewing industry occupies as one of the great wealth-producing factors of our nation, and the extent to which it contributes to the maintenance of other industries. It is impossible, of course, to search out all those branches of business which directly or indirectly depend upon brewing, but even an incomplete statement will serve to dispel many errors which have been fostered by the enemies of our product. We cannot even approximately estimate the amount of money paid annually by the brewers of this country to the masons, machine builders, pump manufacturers, coopers, lumber dealers, and the manufacturers of the many instruments and utensils used in brewing; nor can we fully determine the advantages which agriculture derives from our industry. Much less can we state, with any degree of accuracy, the help which other industries receive from the trade generally. But there are a few items which we can estimate roughly, at least. Thus, from statistical exhibits, officially published, it appears, that the brewers of this country pay, annually, for agricultural products about \$180,000,000. The capital invested in breweries, of which 80 per cent. represents cost of buildings and machineries, is estimated at \$800,000,000. These figures alone suffice to demonstrate

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the economic short-sightedness of those persons who advocate the annihilation of the brewing industry.

The extent to which brewers contributed towards the payment of the national debt, caused by the war of the rebellion, is eloquently expressed by the annual reports of the Internal Revenue Department. Since 1863 and up to 1908, no less than one thousand one hundred and seventy-eight million dollars have been paid into the United States Treasury by the brewers of this country.

CHAPTER X.

AMERICAN HOP CULTURE.

AMERICAN hop-culture has a great future, in spite of the fact that it is confined to but few States, as hops will not grow profitably everywhere.

The climate forbids the profitable growth of hops in all sections of the United States south of the latitude of New York City, Cincinnati, and St. Louis. In the Southern climate the hops run too much to vine, and the fruit fails of its full development. The hop is a Northern plant, and as far north as Manitoba grows wild and in great profusion. On the other hand, not every soil will produce the hop in perfection.

The rich prairie lands of Indiana, Illinois, Iowa, and Minnesota are not favorable to hops, although the climate is propitious. These soils lack something that is essential to the full development of the lupulin. The sections where both soil and climate favor the cultivation of hops are the central and northern counties of New York; here we have a cool climate and a rich soil, full of all the elements that go to make fine hops; Washington and Oregon, with a cool climate, and a soil so deep and rich and virginal that the yield of hops is exceptionally good, both in quantity and quality; and, lastly, California, where the hops are raised mostly in the valleys of the Sacramento and Russian rivers.

Forty years ago Wisconsin raised a crop of about 10,000 bales of hops, but the hop-louse suddenly cut off the crop, and now not more than 2,000 bales are raised

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annually in that State. A few hops are raised each year in the New England States, where the soil is generally too poor to make the yield profitable, and a few in Michigan.

A hop-yard is planted by means of cuttings or "sets," taken from the roots of old vines, and set in the ground about seven feet apart each way, so that there are about 750 hills of hops to an acre. In New York State the vines from these "sets" produce nothing in the first year of growth, being allowed to spread on the ground; about half a crop in the second year, and a full crop in the third year. In California, Oregon and Washington the "sets" are furnished with poles the first year, and produce that year about half a crop, and a full crop the second year. In New York a fair average crop is about one pound of cured hops to the hill, or 750 pounds to the acre; while on the Pacific coast two or three, and, not infrequently, four times that weight is harvested. The hop-yards are generally equipped with poles about fifteen feet high, upon which the vines grow spirally upward; sometimes, however, the hop-vines are trained upon wires, stretched horizontally between stout posts over the rows of hills, with smaller wires or strings leading up to the horizontal wires from each hill.

Some hop-yards are furnished with a single pole to a hill, the poles being from twelve to eighteen feet high, with strings running obliquely upward from the middle of one pole to the top of its neighbor. The prettiest hop-yard—that is the one most beautiful at the time of harvest—is the "tent-yard," where a straight pole, twenty feet high, is set in the center of six or seven hills, into which stakes about five feet high, are placed, and provided with strings leading to the top of the tall central pole, thus forming a regular tent. These tent-yards closely resemble a military camp, a fact which gave rise to the designation, "Camps of King Gambrinus."

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In California, in former years, the hops were largely picked by Chinamen, but since the labor movement, which culminated in the exclusion of Chinese immigration, has brought the employment of such labor into disfavor, the majority of planters hire other help, and Chinamen are now but rarely seen in the hop-yards.

In Washington, and to some extent also in Oregon, the hops are mostly picked by Indians from British Columbia. They cross Puget Sound in their canoes, bringing all their women and children and all their household goods along, and go into camp on the borders of the hop-yards, about the 1st of September of every year. They board and lodge themselves, and always work "by the piece," that is to say, they get a fixed compensation for every box of hops picked by them. All the Indians have to do, is to pick the hops from the vine, and they "pick for all they are worth," most literally; for every cent they earn, for the whole year in most cases, is earned in the three or four weeks of the hop-harvest. Every squaw and papoose picks, from early morning until night, into baskets or shawls, which are emptied into the box and help to swell the family's income for the year. Before the introduction of hops into Washington, about twenty-five years ago, these Indians did not earn a dollar in money in a year, but now, at the close of the hop-harvest, a single Indian family composed of man, wife, and usually several children, will carry home with them one hundred dollars in cash. The difference to that poor family, in comfort and civilization, can easily be understood.

HOP-PICKING We now come to the hop-harvest in the
IN State of New York, and here it is in its
NEW YORK glory. The great counties of Otsego, Schoharie, Montgomery, Herkimer, Oneida, Madison, Onondaga, and Ontario lie along, and mostly a little south of the Erie Canal and the New York Central Railroad, between Albany and Rochester, a belt two hundred

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miles long and fifty miles wide. Franklin and Lewis counties, along the Canadian frontier of New York, have also a considerable hop interest, but for our present purpose we shall confine ourselves to the region situated in the belt we have mentioned, bounded by Albany on the East and Rochester on the West, and dotted, along its whole length of two hundred miles, with the cities of Albany, Schenectady, Amsterdam, Utica, Rome, Syracuse, Auburn and Rochester. Towns and villages of from one to two and three thousand inhabitants, many of them manufacturing towns, and all of them full of women and children willing to work and eager to rusticate for a time, are scattered all over the hop-belt; and from this long line of populous cities, and these thickly settled towns and villages, come the pickers for the hop-harvest. On or about the first day of September, they come with a rush, and usually find a demand equal to the supply. For weeks the hop-grower's good wife has been preparing for them; beds, rough, but comfortable and clean, are set up in every building on the farm—in the house for the women and children, and in the out-buildings (sometimes put up for the purpose), for the men and boys. Bread is baked by the barrel; "dough-nuts" are fried by the bushel. The farmer has already engaged his pickers in the neighboring cities or villages, and, on the appointed day, in they come, some by wagons, sent out the day before to the city, often twenty miles away, some by special railroad trains, chartered for the purpose, and some on foot. Whole families are in the crowd, father, mother and all the children, from the active boy or girl of fifteen years, who can pick two or three boxes, and earn a dollar a day, down to the baby whom the mother takes out into the field and watches while she picks her box, and earns its clothing for the coming winter.

These families are frequently those of hard-working mechanics in the cities, who are glad to give their wives

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and children an outing in the fresh air for three or four weeks, and find them all the richer and happier by reason of the escape from the stony and dirty streets of their urban home. It is a picnic for the children, and their pranks, when they first arrive, are a sore trial to the steady farmer and his wife. But after the first day's work (from six in the morning until twelve at noon, and from 12:30 P. M. until six at night) is over, they are well sobered down for bed, and their surplus energies are thereafter turned into the channel that leads to the hop-box in the morning and to bed at night. Many a poor factory girl finds in the hop-fields the only fresh country air she breathes in the whole year; and while she is laying in the year's stock of health, her nimble fingers are bringing to her more money than the work in the stifling mill.

To the hop-grower, the harvest, by reason of high prices for hops, is sometimes very profitable. Sometimes, by reason of low prices, it is very unsatisfactory. But to the poor families in the surrounding towns and villages it is always a blessing; for, no matter whether the price of hops be high or low, the compensation for picking is always the same. Let us see how it foots up. The hop-crop of the United States amounts to about 200,000 bales, of 180 pounds each. It takes fifteen boxes for a bale, and for each box the picker is paid about fifty cents cash, or its equivalent in cash and board. Fifteen boxes at fifty cents each makes \$7.50; hence, for 200,000 bales the pickers receive about fifteen hundred thousand dollars.

We have taken a round number which does not accurately represent the actual production for the year 1908, for in that year the American hop-growers produced about 216,660 bales or 39,000,000 pounds of hops—a comparatively very small quantity; in fact, 11,000,000 pounds less than in the preceding year and 21,000,000 pounds less than in the year 1906.

There are two reasons for this decrease, viz.: 1. be-

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cause between 1901 and 1907 the production of beer increased at an unusual rate and the growers extended their operations accordingly, running perhaps a trifle ahead of prospective demand; 2. because as a result of the panic the production of beer has decreased.

Up to 1899 New York produced the largest quantity of hops; thereafter Oregon took and maintained first place and from 1902 to the present time California wrested even second place from New York, so that in point of production this State now holds the third place among the four hop-producing States of our country, the fourth being Washington. Less than one per centum of the total quantity of hops raised in the United States is produced outside of these four States in each of which hop-culture is confined to a few counties. This peculiar localization obtains in all countries, Germany excepted.

The United States, Germany, Austro-Hungary, Russia and New Zealand are the only countries which produce more hops than they consume. The quantity exported from Germany is largest, almost equal to the exportation from the United States and Austro-Hungary combined.

For the years 1895 to 1899 the average annual exportation from the United States amounted to 15,827,630 pounds; and from 1900 to 1904 to 11,863,626 pounds; the average annual imports during the same periods amounted to 2,414,966, and 3,704,411 pounds, respectively. In 1906 and 1907 the exportation amounted to 17,701,436 and 16,099,950 pounds, respectively.

The available but unused area of soil suitable for the cultivation of hops, the fertility of such soil (in the Pacific States), and the favorable climate secure to American brewing an abundance of material for all future time, no matter how rapidly and extensively the industry may develop hereafter. In all likelihood the insignificant importation of Bohemian and German hops, noted for

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their superior quality, will cease entirely within a few years when the laudable efforts of the United States Agricultural Department to improve and perfect the quality of the American product shall have accomplished its purpose.

CHAPTER XI.

AMERICAN BARLEY.

ALTHOUGH any cereal artificially germinated is termed malt, yet, for various reasons malt made from barley is meant when no other designation save this general term is given. In past ages, wheat, corn and oats were used in brewing quite as frequently as barley, and there are many statutory evidences, showing that the governments of the various beer-producing countries forbade the malting of any grain the production of which was insufficient to supply the necessary food for the people. The very first beer brewed in New York by the Dutch colonists, was made of oats, there being an abundance of that grain on Manhattan Island. The Puritans of New England, on the other hand, seem to have malted wheat in great quantities, as appears from an order of the General Court of Massachusetts Bay, forbidding the use of that grain, but permitting the malting of oats or other cereals. At the present time the use of barley is pretty general. The quantity of barley produced throughout the world eludes exact computation, however, because this grain is grown in every zone and in many semi-barbarous countries, where the collection of agricultural statistics is unknown. In regard to hops, the case is different, for that plant is cultivated exclusively for use in breweries, and its cultivation moves within clearly defined geographical limits. Barley serves largely as food; in some countries bread is made of it, to the almost entire exclusion of other grain, and its use in cookery prevails in all countries.

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In view of these facts, we can only take into consideration the consumption of barley in the form of malt. The data here offered will be better understood, if it be borne in mind that all light beers of that peculiarly vinous taste which has of late become somewhat popular, are made of malt and rice or corn, as in the case of the excellent Pilsen brands. The prevailing taste, however, still calls for a brewage of a deep reddish-brown color, peculiar to heavily malted beers. This question may as well be dropped, it being one of taste, about which, according to an old proverb, there can be no conclusive arguments.

The production of barley in the United States expands continually, and the repeated increases of the protective duty on the foreign product—pointedly aimed at the Canadian barley—have doubtless given additional impetus to this growth. Necessarily, the business of malting has kept pace with the rapid development of brewing, and one of the inevitable results of the suddenly enlarged demands was the establishment of many separate malt-houses, fitted up with all modern improvements. This progress, in turn, led, in a very large measure, to the discontinuance of malting by brewers. At the present time, a comparatively small number of brewers malt their own barley, it being more profitable and, usually, more satisfactory to draw on the maltster for the requisite supplies.

SPECIES OF
BARLEY

Concerning the manufacture of malt, we have already said what might appear to be of interest to the reader. The successful pursuit of it requires not only great skill in the handling of the grain while undergoing the interesting process of artificial germination, but also much experience and practice in the selection of the material. There are many species of barley, distinguished from each other by, and named according to, the number of rows which form the ear; thus we have two-rowed, four-rowed and six-rowed barley. Of these and other species a number

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of varieties exist, and the quality of all varies very materially, according to the character of the soil. In making his purchases the maltster must be able, of course, to determine whether the grain is of the kind that will yield good beer. Sight, touch and taste aid him in this, and enable him to make sure that the grain is fully ripe, of the last harvest, not too hard and smooth, nor excessively husky; but whether it contains the nitrogenous compounds, starch, salts, etc., in the desirable proportions, he is unable to determine, unless he knows the soil where the barley grew and has tested its qualities before. Given good raw material, the maltster's success depends upon his care and vigilance in preparing for, continuing and interrupting germination at the proper time, and in judiciously handling the grain after these stages. The process begins with steeping and ends with kiln-drying, and its object, as we have already said, is the conversion of starch into sugar. Within the past twenty-five years innumerable inventions have completely revolutionized the old methods of the maltster and placed this manufacture among the most advanced industries. From present indications it appears that the future of malting belongs to the pneumatic process, which is already employed in some of the largest establishments.

Statistical exhibits show that the consumption of malt in our country is proportionately as large as that of most beer-producing countries; and, necessarily, the cultivation of barley in the United States is in proportion thereto. We have this advantage over England, that we need not draw upon foreign countries for any part of our supply of barley, except when a particularly fine grade of grain is desired, such, for instance, as our neighbors on the St. Lawrence raise. In case of necessity, we might do without any foreign barley; England, on the other hand, imports large quantities from Russia, Austria, and the States on

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the North coast of Africa, and is dependent upon these foreign supplies, added to what they obtain here.

As in the case of hops, so also in regard to barley, the American industry might rely entirely upon domestic production, and, in fact, for all practical purposes it is wholly independent of foreign sources of supply. It has become so from necessity, not from choice, for many brewers still consider Canadian barley superior to our own, and would, without a doubt, were it not for the prohibitive duty, import considerable quantities of it and of malt. As matters stand, however, the importation of malt has ceased almost entirely and the importation of barley, bears to our exports the proportion of about one to one hundred. The following figures state the case clearly:

Ten Years.	Exportation of Barley.	Importation of of Barley.
1899 to 1908	101,226,243 bushels	1,012,941 bushels

The aggregate quantities of malt imported during the same decade amounted to 34,658 bushels.

About three-fourths of the quantity of barley and an even larger proportion of hops exported from our country find a ready market in Great Britain and Ireland.

**THE UNIVERSAL
DRINK OF
THE FUTURE** The phenomenal growth of brewing throughout the world during the past fifty years has given rise to many speculations as to the future of malt liquors, and many very able writers do not hesitate to call beer the universal drink of the future. Formerly confined to about four great States, the use of malt liquors is now known in every civilized land; and even in Southern countries, where the grape-vine abounds, beer is gradually superseding every other beverage. In France, a wine-country without equal, the most eminent scientists advocate the use of beer in preference to any other liquor. Spain, Italy, and even China and Japan, are now being invaded by King Gambrinus, and it is, indeed,

American Beer.

only a question of time when beer shall be, as prophesied, the universal drink. The literature, in languages other than English and German, on the subject of beer, proves conclusively that the best minds regard it as a worthy undertaking to write on a question which materially affects the welfare of the people. A story is told of a band of young heathens, whom the Japanese Government sent to Germany to learn the art of brewing, which has since been introduced into that country. When the young men returned, muscular, yet rotund, with a healthy glow upon their cheeks, and elasticity and strength in all their movements, the ministers were so strongly impressed with the vitalizing effects of beer, that they ordered a merchantman to proceed to Germany, load up with beer, and return poste-haste to Japan. The result of this expedition is said to have accelerated the establishment of the first brewery in the Mikado's realm.

The most remarkable part of this progress of brewing is, that in many instances, as, for example, in France, it was effected in spite of the popular clamor against the Teutonic drink; and still more remarkable is it that those who began by opposing its use most bitterly, ended by advocating it most fervently.



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